SERVICE MANUAL

NORDIC INVERTER SERIES

ASH-09AIN PT, ASH-12AIN PT

sinclair
AIR CONDITIONING

1 Summary and features

Model	Remark
ASH-09AIN PT ASH-12AIN PT	220-240V～ 50Hz 1ph R410A

2. Specifications and Technical Parameters

Model		ASH-09AIN(PT)	
Function		COOLING	HEATING
Rated Voltage		1Ph – 220-240V~	
Rated Frequency		50Hz	
Total Capacity (W/Btu/h)		3000/2500	3200/2750
Power Input (W)		1350/780	1400/760
Rated Input (W)		1400	1450
Rated Current (A)		6.2	6.3
Air Flow Volume (m^3/h) (H/M/L)**		490	
Dehumidifying Volume (l/h)		1.2	
EER / C.O.P (W/W)		2.2/3.21	2.3 /3.61
Energy Class		/	
Indoor unit	Model of Indoor Unit	ASH-09AIN PT	
	Fan Motor Speed (r/min) (H/M/L)	1160 / 1010 / 890	
	Output of Fan Motor (w)	14	
	Input of Heater (w)	None	
	Fan Motor Capacitor (uF)	1	
	Fan Motor RLA(A)	0.14	
	Fan Type-Piece	Cross flow fan – 1	
	Diameter-Length (mm)	ϕ97---583	
	Evaporator	Aluminum fin-copper tube	
	Pipe Diameter (mm)	7	
	Row-Fin Gap(mm)	2-1.4	
	Coil length (l) x height (H) x coil width (L)	580X228.6X25.4	
	Swing Motor Model	MP28VA	
	Output of Swing Motor (W)	2	
	Fuse (A)	PCB 3.15A Transformer 0.2A	
	Sound Pressure Level dB (A) (H/M/L)	42 / 39 / 36	
	Sound Power Level dB (A) (H/M/L)***	49 / 45/ 42	
	Dimension (W/H/D) (mm)	770X190X250	
	Dimension of Package (L/W/H) (mm)	855X272X330	
	Net Weight /Gross Weight (kg)	8.5/12.5	

Outdoor unit	Model of Outdoor Unit		ASH - 09AIN (PT)
	Compressor Manufacturer/trademark		MITSUBISHI
	Compressor Model		KNB092FHBMC
	Compressor Type		rotary
	L.R.A. (A)		25
	Compressor RLA(A)		3.89
	Compressor Power Input(W)		895
	Overload Protector		None
	Throttling Method		Capillary throttling
	Starting Method		Transducer starting
	Working Temp Range (℃)		-10℃≤T≤43℃
	Condenser		Aluminum fin-copper tube
	Pipe Diameter (mm)		9.52
	Rows-Fin Gap(mm)		1-1.6
	Coil length (l) x height (H) x coil width (L)		608X508X22
	Fan Motor Speed (rpm)		830±20
	Output of Fan Motor (W)		30
	Fan Motor RLA(A)		0.3
	Fan Motor Capacitor (uF)		2.5
	Air Flow Volume of Outdoor Unit		/
	Fan Type-Piece		Axial fan –1
	Fan Diameter (mm)		400
	Defrosting Method		Auto defrost
	Climate Type		T1
	Isolation		I
	Moisture Protection		IP24
	Permissible Excessive Operating Pressure for the Discharge Side(MPa)		3.8
	Permissible Excessive Operating Pressure for the Suction Side(MPa)		1.2
	Sound Pressure Level dB (A) (H/M/L)		53
	Sound Power Level dB (A) (H/M/L)		63
	Dimension (W/H/D) (mm)		848X260X540
	Dimension of Package (L/W/H)(mm)		878X360X590
	Net Weight /Gross Weight (kg)		35/40
	Refrigerant Charge (kg)		R410A / 0.78
Connection Pipe	Length (m)		4
	Gas additional charge(g/m)		15
	Outer Diameter	Liquid Pipe (mm)	Φ6(1/4")
		Gas Pipe (mm)	Φ9.52(3/8")
	Max Distance	Height (m)	5
		Length (m)	10

The above data is subject to change without prior notice.

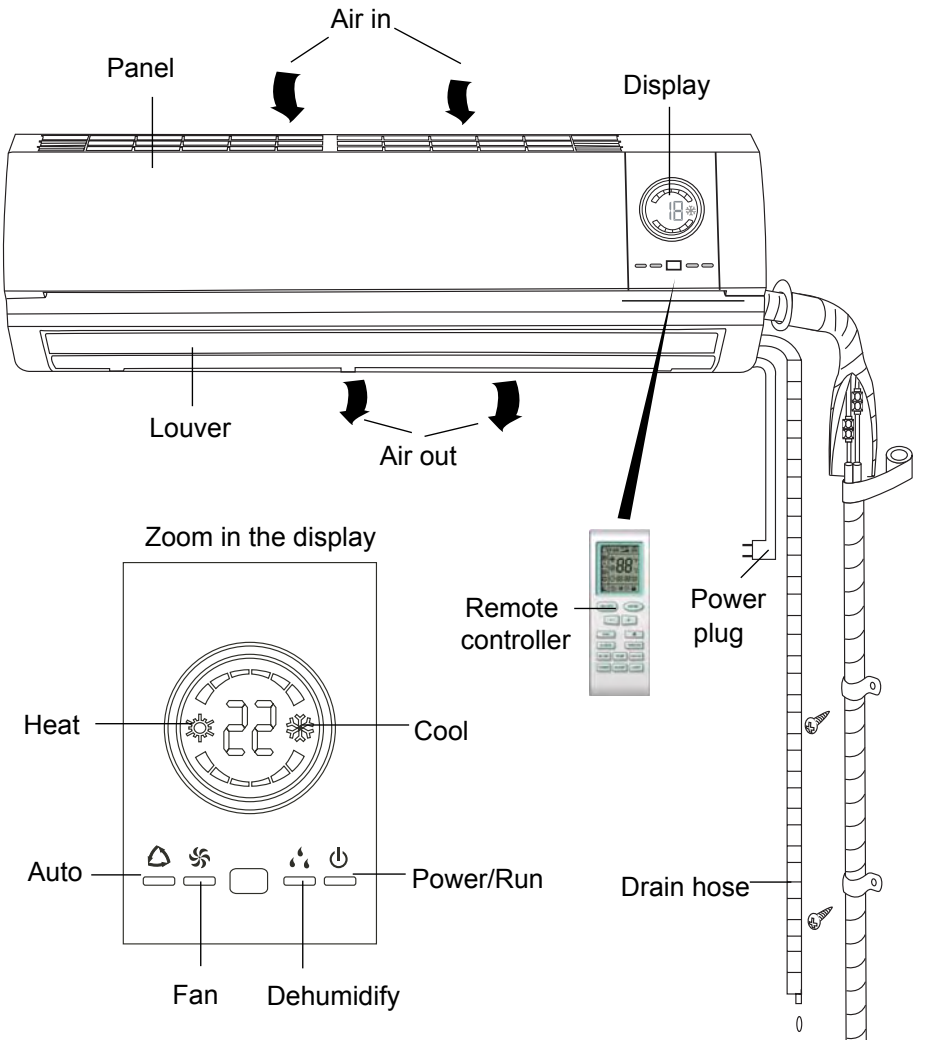
Model		ASH - 12AIN (PT)	
Function		COOLING	HEATING
Rated Voltage		1Ph – 220-240V~	
Rated Frequency		50Hz	
Total Capacity (W/Btu/h)		4000/3500	4300/4000
Power Input (W)		1500/1090	1420/1108
Rated Input (W)		1600	1650
Rated Current (A)		7	7.2
Air Flow Volume (m^3/h) (H/M/L)**		550	
Dehumidifying Volume (l/h)		1.6	
EER / C.O.P (W/W)		2.67/3.21	3.01/3.61
Energy Class		A/A	
Indoor unit	Model of Indoor Unit	ASH-12AIN PT	
	Fan Motor Speed (r/min) (H/M/L)	1250/1100/1050	
	Output of Fan Motor (w)	20	
	Input of Heater (w)	None	
	Fan Motor Capacitor (uF)	1	
	Fan Motor RLA(A)	0.152	
	Fan Type-Piece	Cross flow fan	
	Diameter-Length (mm)	ϕ92.1—616	
	Evaporator	Aluminum fin-copper tube	
	Pipe Diameter (mm)	7	
	Row-Fin Gap(mm)	2-1.4	
	Coil length (l) x height (H) x coil width (L)	681×324.3×38.1	
	Swing Motor Model	MP28EA	
	Output of Swing Motor (W)	2	
	Fuse (A)	Controller3.15 transformer0.2	
	Sound Pressure Level dB (A) (H/M/L)	42 / 39 / 38	
	Sound Power Level dB (A) (H/M/L)***	52 / 49 / 48	
	Dimension (W/H/D) (mm)	830×285×189	
	Dimension of Package (L/W/H) (mm)	906×385×265	
	Net Weight /Gross Weight (kg)	11/14	

Outdoor unit	Model of Outdoor Unit		ASH - 12AIN (PT)
	Compressor Manufacturer/trademark		MITSUBISHI
	Compressor Model		KNB092FHBMC
	Compressor Type		Double-rotor
	L.R.A. (A)		33
	Compressor RLA(A)		3.92
	Compressor Power Input(W)		960
	Overload Protector		Int11l-3979
	Throttling Method		Capillary throttling
	Starting Method		Transducer starting
	Working Temp Range (℃)		-10℃≤T≤43℃
	Condenser		Aluminum fin-copper tube
	Pipe Diameter (mm)		7
	Rows-Fin Gap(mm)		2-1.4
	Coil length (l) x height (H) x coil width (L)		608/498/22
	Fan Motor Speed (rpm)		880±20
	Output of Fan Motor (W)		30
	Fan Motor RLA(A)		0.3
	Fan Motor Capacitor (uF)		2
	Air Flow Volume of Outdoor Unit		/
	Fan Type-Piece		Axial fan-1
	Fan Diameter (mm)		400
	Defrosting Method		Auto defrost
	Climate Type		T1
	Isolation		I
	Moisture Protection		IP24
	Permissible Excessive Operating Pressure for the Discharge Side(MPa)		3.8
	Permissible Excessive Operating Pressure for the Suction Side(MPa)		1.2
	Sound Pressure Level dB (A) (H/M/L)		≤55
	Sound Power Level dB (A) (H/M/L)		≤65
	Dimension (W/H/D) (mm)		848X260X540
	Dimension of Package (L/W/H)(mm)		878X360X590
	Net Weight /Gross Weight (kg)		39/43
	Refrigerant Charge (kg)		R410A / 1.17
Connection Pipe	Length (m)		4
	Gas additional charge(g/m)		15
	Outer Diameter	Liquid Pipe (mm)	Φ6(1/4")
		Gas Pipe (mm)	Φ12(1/2")
	Max Distance	Height (m)	5
		Length (m)	10

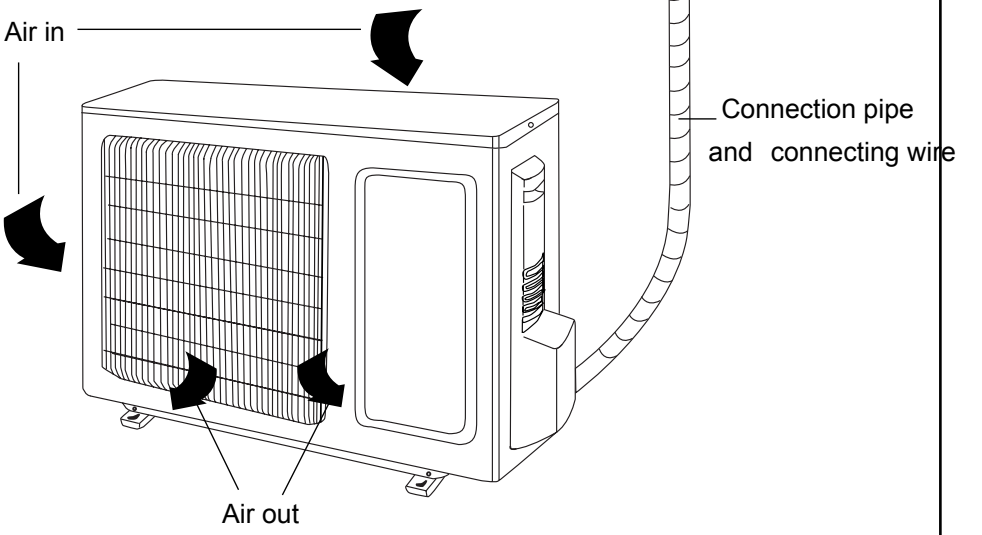
The above data is subject to change without prior notice.

3 Component Name

Indoor unit

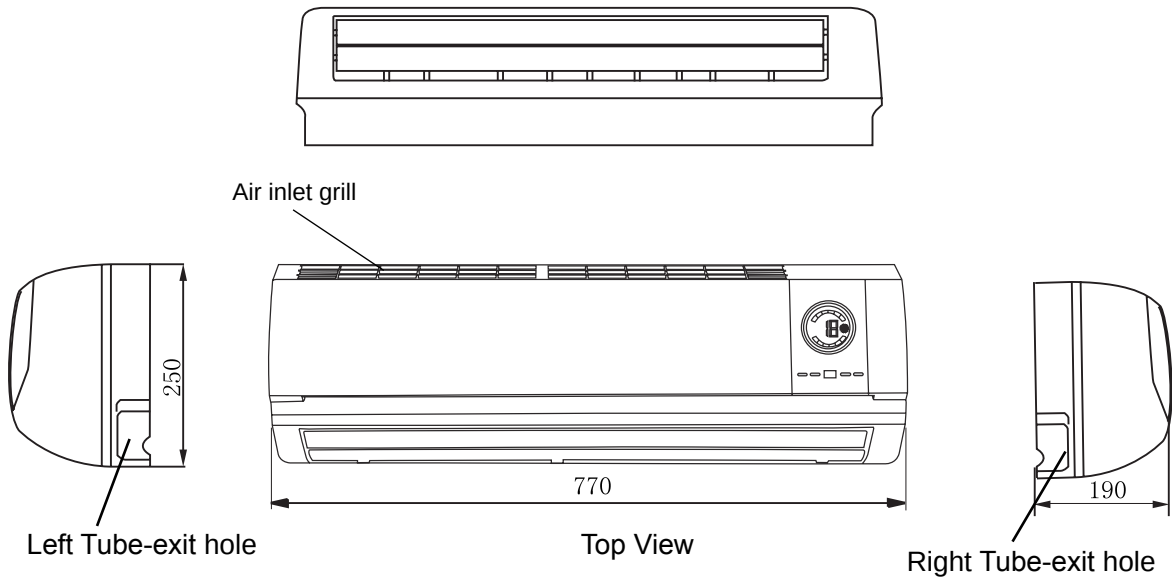


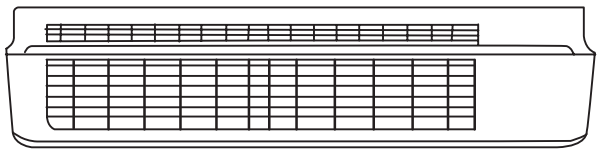
Outdoor unit



4 Overall and Installing Dimension

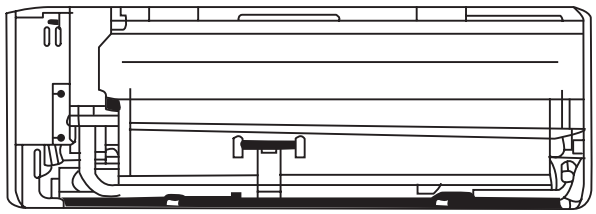
4.1 Overall and Installing Dimension of Indoor Unit(9K)

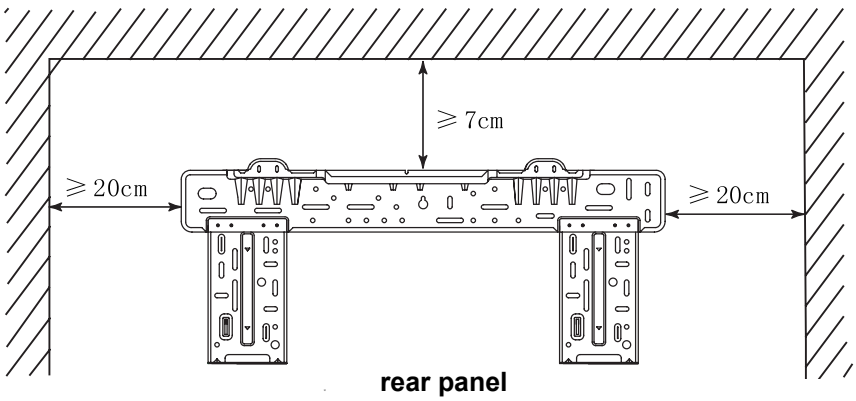




Rear View

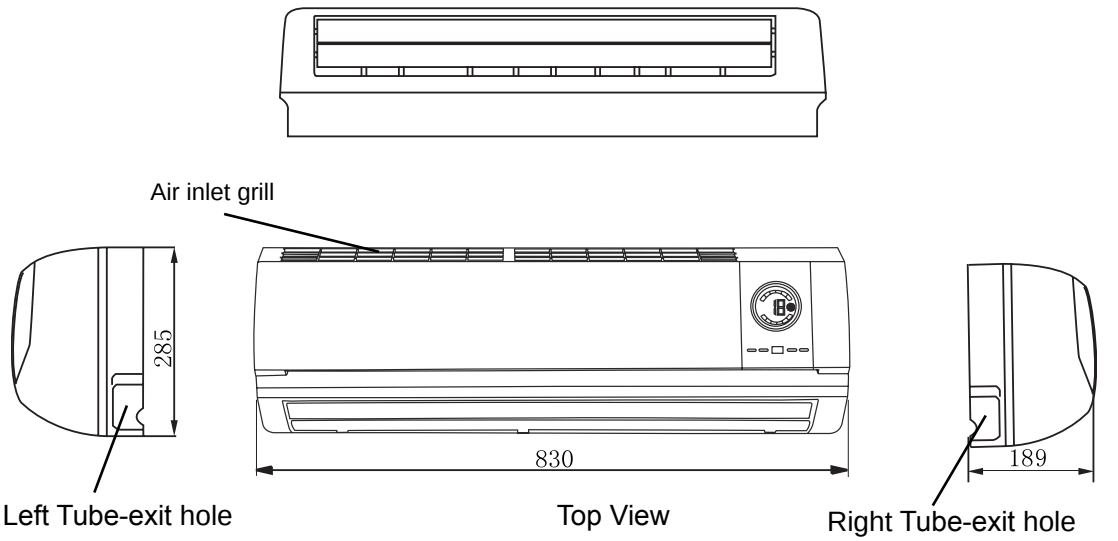
Unit: mm

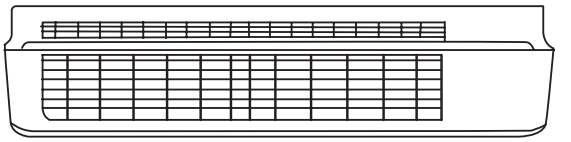




rear panel

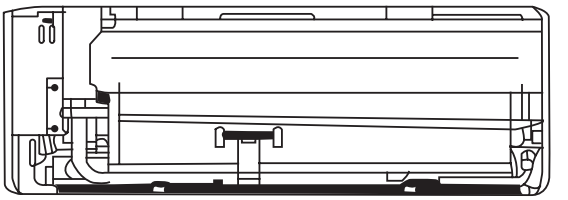
4.2 Overall and Installing Dimension of Indoor Unit(12K)

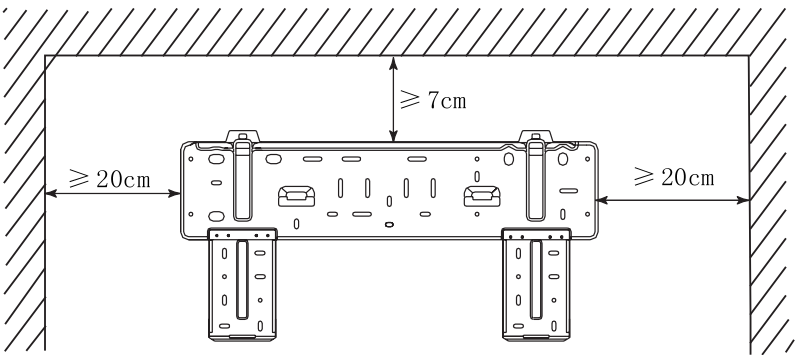




Rear View

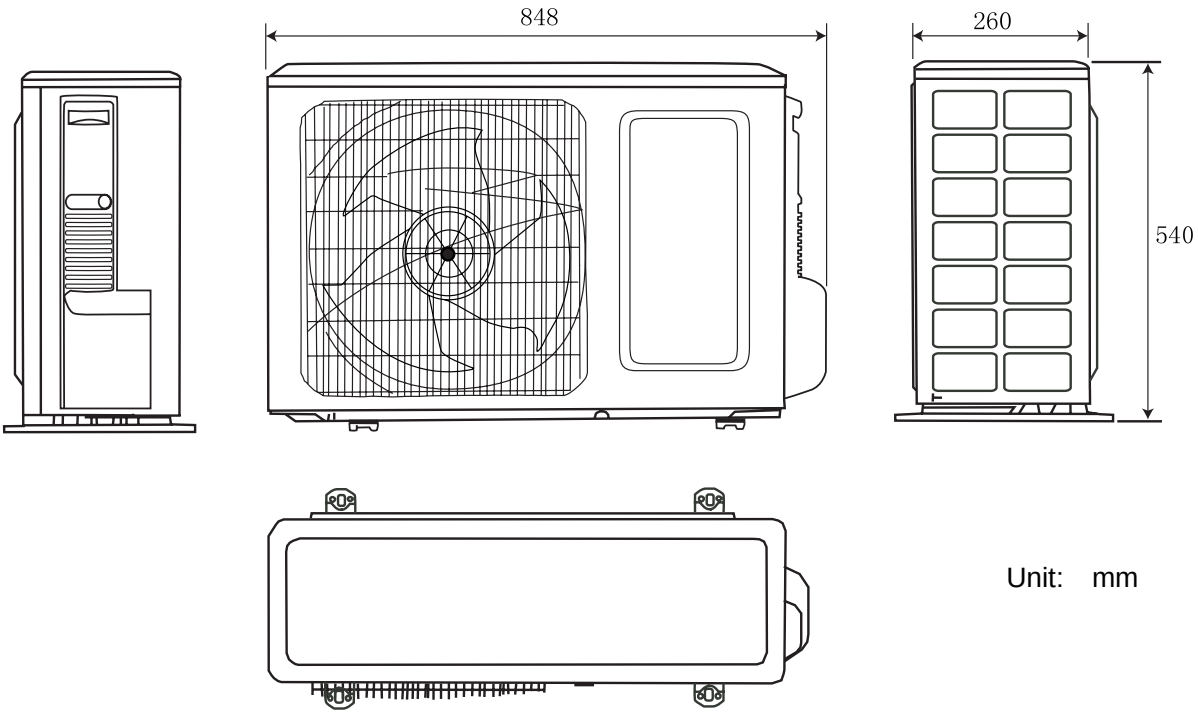
Unit: mm



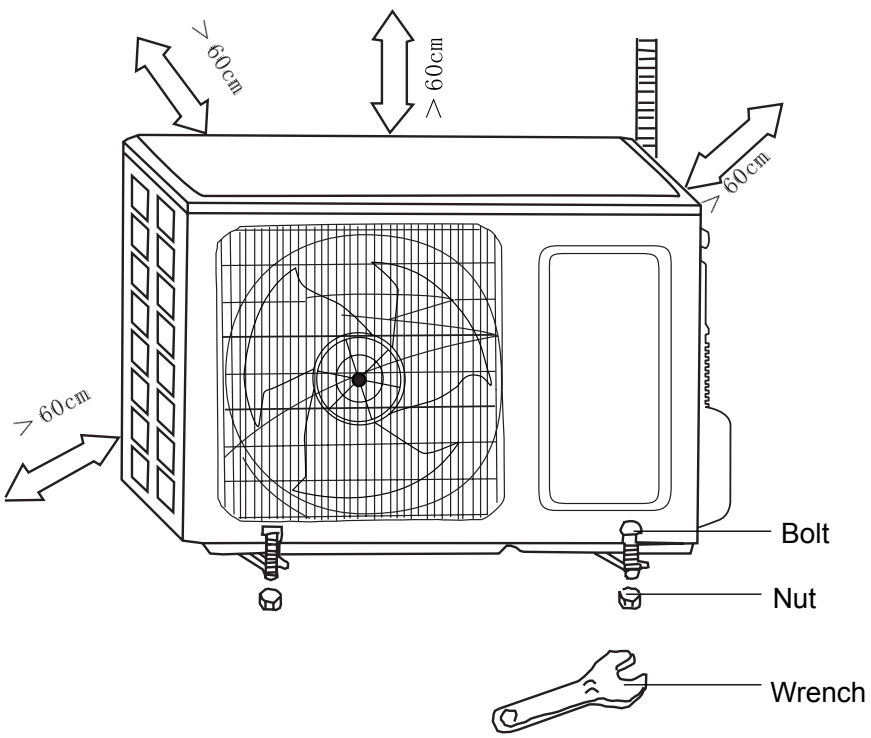


rear panel

4.3 Overall and Installing Dimension of Outdoor Unit

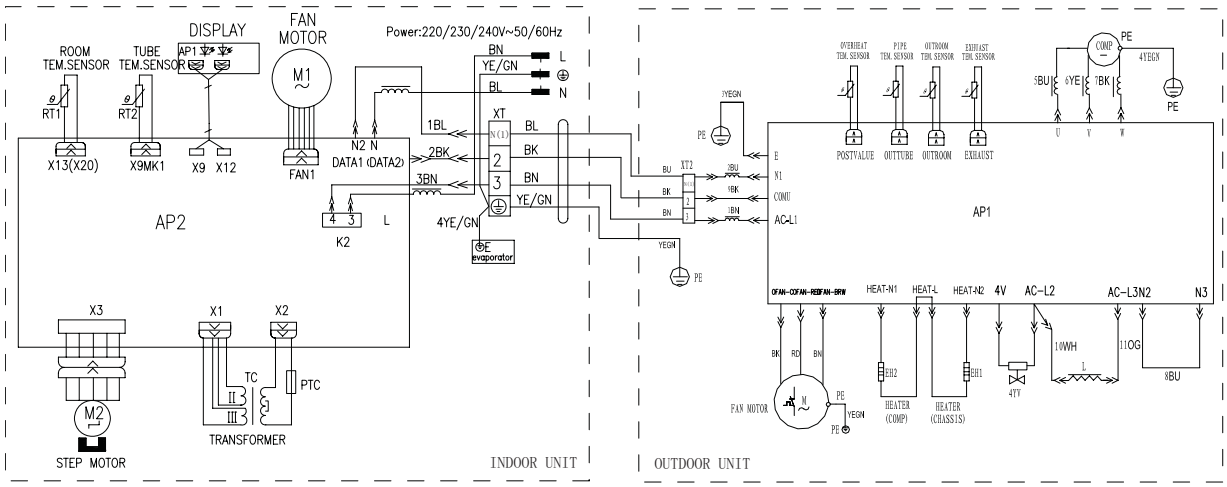


Unit: mm



5. Electrical Diagram

ASH-09AIN PT ASH-12AIN PT



6 Manual of functions of remote controller and operation method

6.1 Manual of functions of remote controller

6.1.1 Temperature parameter

- **The room setting temperature(Tpreset)**
- **The room ambient temperature (Tamb)**

6.1.2 Basic Functions

It will delay 3 minutes for restarting unit after compressor is stoped .

6.1.2.1 **Cooling Mode**

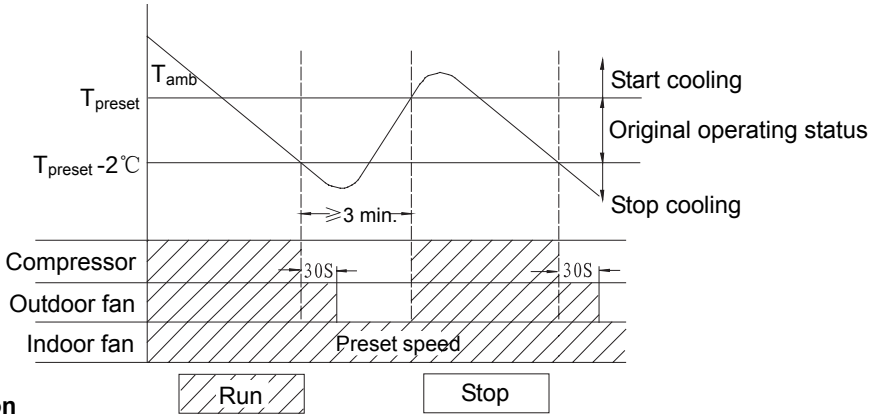
6.1.2.1.1 **Cooling Conditions and Process**

When $T_{amb.} \geqslant T_{preset}$, the unit will run under cooling mode, in which case the compressor \ indoor fan and outdoor fan will start , the indoor fan will run at setting speed.

When $T_{amb.} \leq T_{preset}$ -2℃, the compressor will stop, the outdoor fan will atop running after 30 seconds,the indoor fan will run at setting speed.

When T_{preset} -2℃$< T_{amb.} <$ T_{preset} +1℃, the unit will maintain its original operating status.

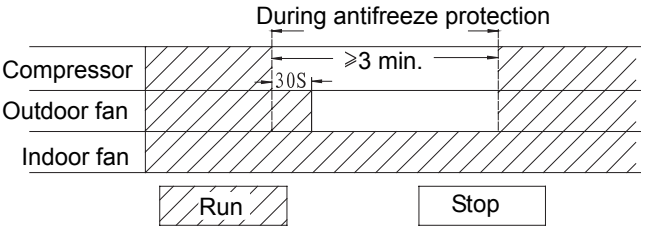
- Under this mode, the switchover valve will not be powered on, and the setting temperature range is16 ~30℃ .
- The air conditioner will adjust the running frequency of the compressor automatically according to the change of ambient temperature.



6.1.2.1.2 Protection

◆ **Antifreeze Protection**

When the antifreezing pretection is detected,the compressor will stop,the outdoor fan will stop after 30s , the indoor fan motor and swing fan motor will run at original run conditions under the cool mode.Indoor fan motor will run at low speed and indoor fan motor will run at oroginal conditions under the dehumidify mode.When ant-ifreezing protection is eliminated and the compressor has stopped for 3 minutes,the whole unit will run in the oroginal mode.



◆ Overcurrent protection

If total current is high,the compressor wil run in limited frequency.If total current is over the stop-running current,then the compressor will stop,the outdoor will delay 30 seconds to stop.

6.1.2.2 DRY Modes

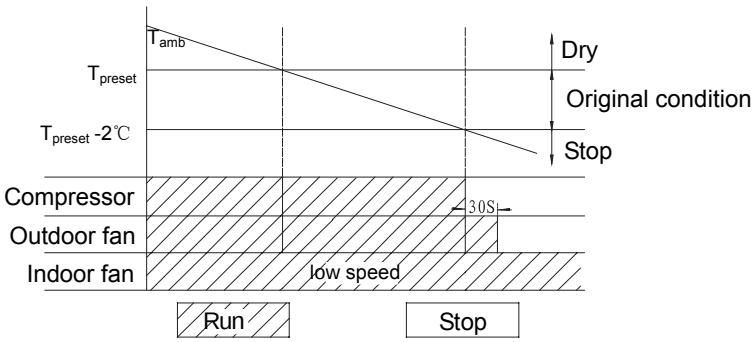
6.1.2.2 .1 The conditions and process of DRY

When $T_{amb.} > T_{preset}$, the unit will run under DRY mode, in which case the compressor \indoor fan and outdoor fan will be started and the indoor fan will run at low speed.

When Tpreset -2<T amb<Tpreset , the unit will run with original setting.

When $T_{amb.} < T_{preset}$-2℃, the compressor will be stopped, and outdoor fan will be stopped after 30 seconds,the indoor fan will run at low speed.

- Under this mode, the switchover valve will not be powered on, and the setting temperature range is16 ~30℃ .
- The air conditioner will adjust the running frequency of the compressor automatically according to the change of ambient temperature.



② **Protection**

◆ **Protection function is the same with cool mode**

（3）**HEAT Mode**

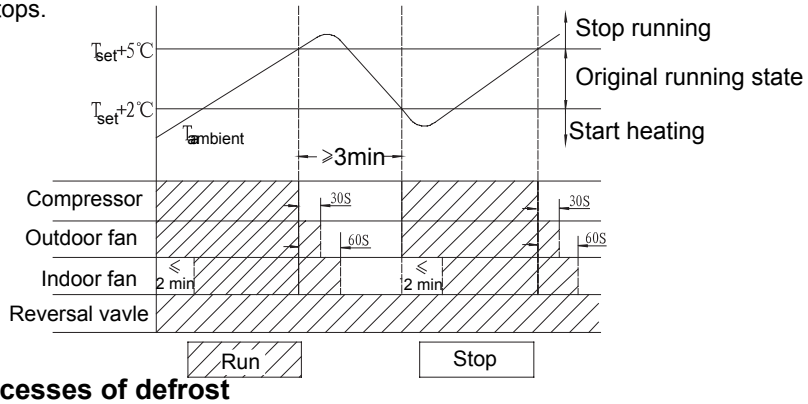
① **The conditions and process of heating**

When Tamb ≤ Tset +2 ℃ ,the system enters heating running, in this case, the reversal valve, compressor, out fan enter simultaneously running.The indoor fan will run with setting fan speed and anti-coolwind will be runned.

When Tamb ≥Tset +5 ℃,the compressor will stop, and outdoor fan will be stopped in 30 seconds,the indoor unit will run at setting fan speed for 60s then will stop .The switchover valve will be powered off after compressor is stopped for 2 minutes under heating-off mode or the condition that heat is changed to other modes

When Tset+2℃<Tamb<Tset+5℃ ,unit will keep the original operation status.

- Under this mode, the switchover valve will be powered on, and the setting temperature range is16 ~30℃ .
- The air conditioner will adjust the running frequency of the compressor automatically according to the change of ambient temperature.
- When the unit is turned off in HEAT mode, or switched to other mode from HEAT mode, the four-way valve will be powered off after the compressor stops.



② **Conditions and processes of defrost**

When frost is detected in the condenser, the system will enter into defrosting state. When defrosting starts, the compressor and indoor fan will stop, and the outdoor fan and four-way valve will delay 30 seconds to stop. The compressor will start after 30 seconds and then defrosting will be started. When the compressor has run for 8 minutes , the compressor will stop After 30 seconds the four-way valve opens and afteranother 60 seconds, the compressor and outdoor fan resume running. The indoor fan will delay 2 minutes to run at the latest.

③ Protection

◆ Overcurrent protection

If total current is high,the compressor wil run in limited frequency.If total current is over the stop-running current,then the compressor will stop,the outdoor will delay 30 seconds to stop.

（4）Fan mode

Under FAN mode,the indoor fan motor can choose high\middle\low\auto mode to run,compressor\outdoor fan motor and 4-way vavle will stop running.

- Under this mode, the range of setting tem. is 16-30 ℃
- The air conditioner will adjust the running frequency of the compressor automatically according to the change of ambient temperature.

（5）**Auto Mode**

Under this mode, the system will automatically select its run mode (cool, dehumidify, heat or fan) with the change of ambient temperature. For protection function, same as under cooling and heating mode.When the ambient temp. is changed, it prior to change mode.

- The air conditioner will adjust the running frequency of the compressor automatically according to the change of ambient temperature.

3 Protection function in each mode

（1 ）Overload protection

When tube temp. is detected high,the compressor runs in limited frequency or slow-frequency.When the temp. is over standard,then compressor stop running.In auto HEAT or HEAT mode,the indoor fan will blow for 60 seconds and then stop. In other modes,the indoor fan will run at the setting speed.

（2 ）Compressor discharge tempreture protection

When the temp. is over the standard,then compressor stop running.When the discharge temp. resume the original conditions and compressorhas stop running for 3 minutes,the compressor will resume running.

（3 ）Communication mulfunction

There have communication mulfunction when unit don't receive the correct signal for 3 minutes,the unit will stop running.

（4 ）Module protection

When module is in protection,the compressor will stop.It will resume running after stopping for 3 minutes.During the period of module protection,there will display mulfunction in indoor unit,and the total unit will stop running.

4 Other control

（1 ）ON/OFF

The switch status is changed one time when pressing the ON/OFF key.

（2 ）Mode function

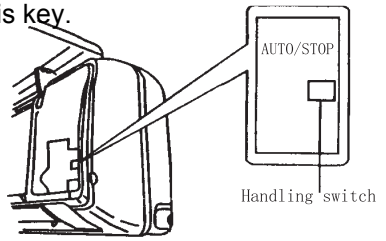
Unit will choose and disolay the below mode when pressing mode key:AUTO,COOL DRY,FAN,HEAT,AUTO.

（3 ）TEMP. setting button

Each time TEMP or TEMP button is pressed, the set temperature will be increased or decreased by 1℃ . Adjusting range is 16--30℃ . In AUTO mode, this button does not function.

（4 ）Auto key

If controller is turned on,it will be stoped when pressing this key.If controller is turned off,unit will run with auto and swing is running when pressing this key.

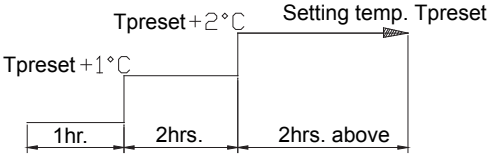


（5 ）Timer control

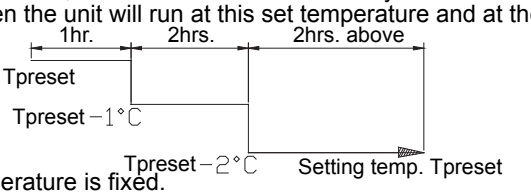
The unit is turned on or off according to the timer set by the remote controller.

（6 ）Sleep function

When the air conditioner is in COOL or DRY mode, after Sleep mode has been set properly, the preset Tset will be increased by 1℃after the sleep program has run for 1 hour, and Tset will be increased by another 1℃ after 2 hours. Tset has been increased by 2 totally in two hours. Then the unit will run at this set temperature and at the set speed.



When the air conditioner is in HEAT mode, after Sleep mode has been set properly, the preset Tset will be decreased by 1℃after the sleep program has run for 1 hour, and Tset will be decreased by another 1℃after 2 hours. Tset has been increased by 2 totally in two hours. Then the unit will run at this set temperature and at the set speed.



In FAN and AUTO mode, the set temperature is fixed.

（7 ）Indoor fan control

Use the remote controller to set the indoor fan running at HIGH, MED or LOW speed.At this time the fan will run at high, medium or low speed. It can also be set to AUTO.

➢During switch in each fan speed, there should be 30s at least delay.

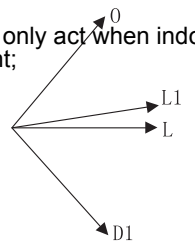
(8) Power supply for outdoor unit

The power supply for outdoor unit is turned on in AUTO, COOL, HEAT and DRY mode under turn-on state.

The power supply for outdoor unit will delay 3 minutes to turn off under turn-off state or in the FAN mode under turn-on state.

（9）Swing control

Use the SWING button of the wireless remote controller to controller SWING On and Off. Swing will only act when indoor fan is running.After power on, the stepping motor turns back to 0 position and closes the air outlet vent; after the unit is in cool mode,it will turn back to the max. air outlet D1 position,then swing back to L position for the next order;When unit is in Heat mode,quide louver stop at D1 position;If the unit is under swing mode,it will swing betewwn L1 and D1 position.When unit is turned off,it will turn back to



（10）Buzzer

The controller is powered on and detect the signal received, the buzzer will beep.

（11）Memory function

Memory contents of power off: Mode, Swing, Set temp., Set fan speed, Timer ect; when unit is turned On, when repowered on, there should be 3 minutes above then can supply power to outdoor unit; when unit is off, when repowered on, the indoor unit can supply power to outdoor unit at once.

（12）Compressor delay protection

In Cool, Dry, Heat modes, every start of compressor there should be 3 minutes delay.

（13）Outdoor unit malfunction display

	Malfunction	Red	Yellow	Green
1	Compressor opened		Blink once	
2	Defrosting		Blink twice	
3	Anti-freezing protection		Blink three times	
4	IPM protection		Blink 4 times	
5	Over current protection		Blink 5 times	
6	Overload unit stop protection		Blink 6 times	
7	Air exhaust unit stop protection		Blink 7 times	
8	Compressor overload protection		Blink 8 times	
9	Limit requency (currency)	Blink once		
10	Frequency declined (Air exhasut)	Blink twice		
11	Frequency limit (Overload)	Blink 3 times		
12	Frequency declined (anti-freezing)	Blink 4 times		
13	Outdoor tube temp sensor malfunction	Blink 5 times		
14	Outdoor ambient temp sensor malfunction	Blink 6 times		
15	Outdoor air exhaust temp sensor malfunction	Blink 7 times		
16	Arrive at temp. of unit on	Blink 8 times		
17	Communication is normal			Normal

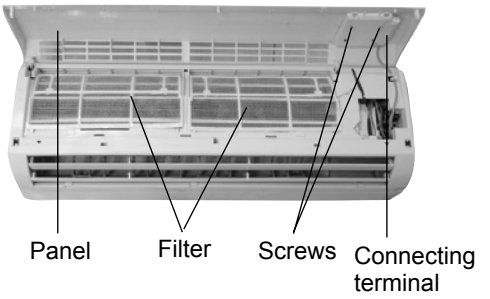
7 Disassembly procedures

7.1 Disassembly procedures for indoor unit of unit 9KK

Operation procedures/pictures

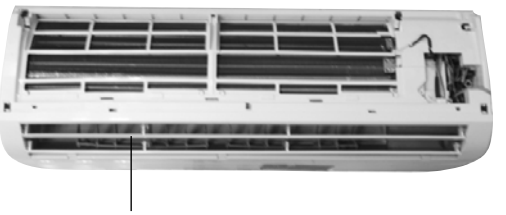
1. Disassembling the front panel and filters

Unloose the clasps on both sides and lift the panel upward. Unplug the two connecting terminals of the display and slide out the rear clasp from the groove to take off the front panel.Push the filter upward,loosen the clasps,then you can pull out the filters



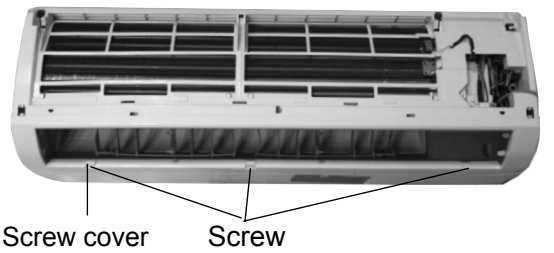
2. **Disassemble Guide Louver**

Manually bend the guide louver to loose the clasp at the guide louver. Remove the guide louver.



3. **Disassemble Front Case**

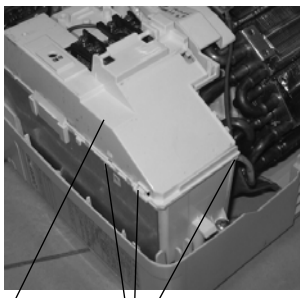
Open the three screw covers at the front case, unscrew the three screws, pull open the clasp at the front case, and remove the front case.

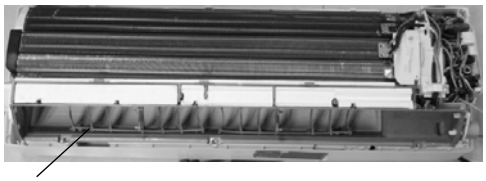


Operating Procedures / Photos

4. **Disassemble Electric Box Cover**

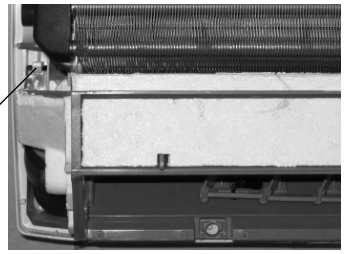
Lossen three clasos, then remove the electric box cover

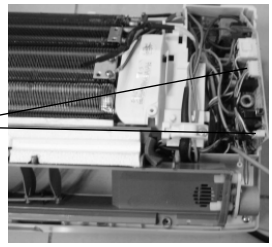




5. **Disassemble Water Tray**

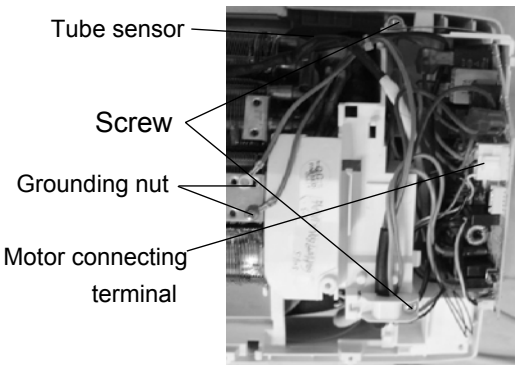
Pull open the holding clasp on the left side of the water tray, disconnect the terminal of the stepping motor, lift and pull out the drainage pipe, and remove the water tray.





6. Disassembling the electric box

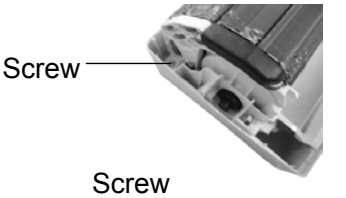
Screw off the two pieces of screws that fix the electric box and unloose the clasp. Pull out the tube sensor, unloose the grounding nut and unplug the motor connecting terminal take out the electric box.

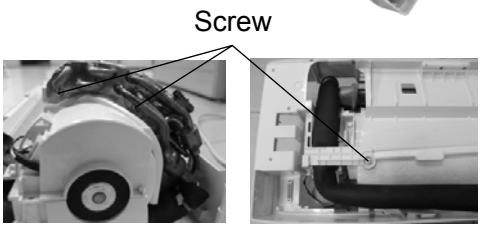


Operating Procedures / Photos

7. **Disassemble Evaporator**

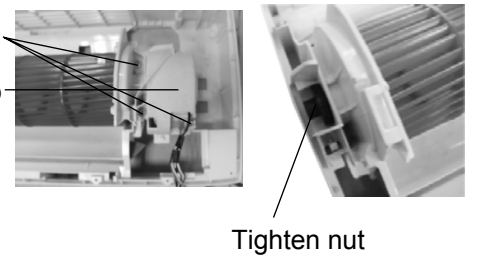
Unscrew the screw to remove the rear pipe clamp. Remove the left and right screws at the evaporator, manually move the evaporator to loosen the clasp of its side plate from the groove. Carefully take out the evaporator and pay attention to protect the connecting pipe.





8. **Disassemble Motor**

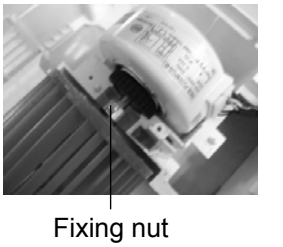
Unscrew the three screws fixing the motor clamp, and remove the motor clamp.



Loosen the holding nut at the shaft sleeve on the right side of the cross flow fan. Slightly lift and then pull out the motor.

9. Disassembling the cross flow fan

Refer to the above steps to take out the cross flow fan from the base plate after taking out the motor.

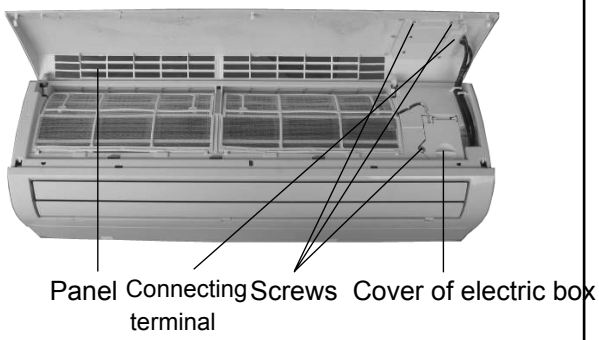


7.2 Disassembly procedures for indoor unit of unit 12k

Operation procedures/pictures

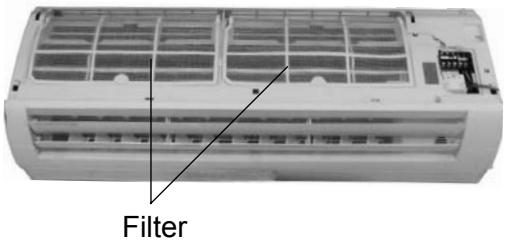
1. Disassembling the front panel and electric box cover

Unloose the clasps on both sides and lift the panel upward. Unplug the two connecting terminals of the display and slide out the rear clasp from the groove to take off the front panel. Screw off the fixing screws of the electric box cover and open the electric box top cover to take it off.



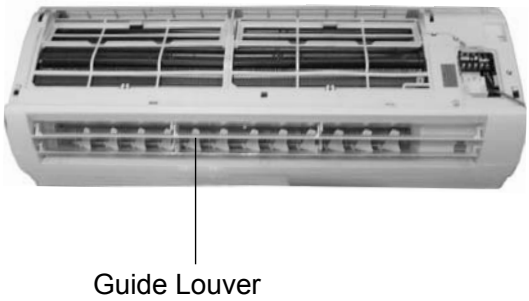
2. **Disassemble Filter**

Push the filter upward,loosen the clasps,then can remove two pieces of filters



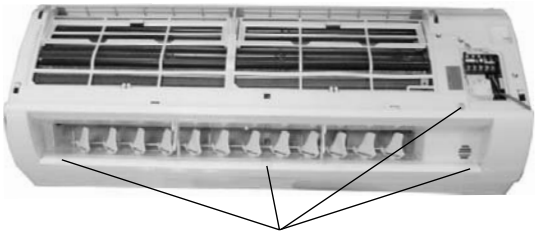
3. **Disassemble Guide Louver**

Manually bend the guide louver to loose the clasp at the guide louver. Remove the guide louver.



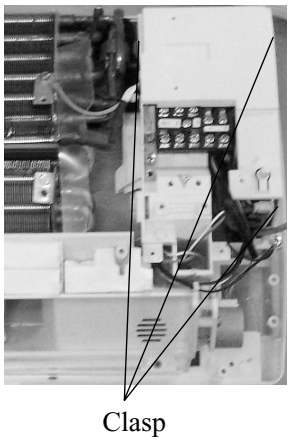
4.**Disassembling the front panel body**

Unclench the 3 screw covers and screw off the 4 pieces of screws that fix the panel body. Unloose the front and rear clasp to take off the panel body.



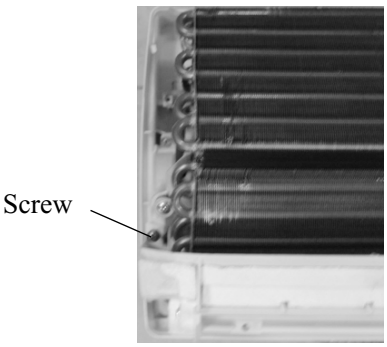
5.**Disassembling the electric box cover**

Unloose the 3 clasps to take off the electric box cover.



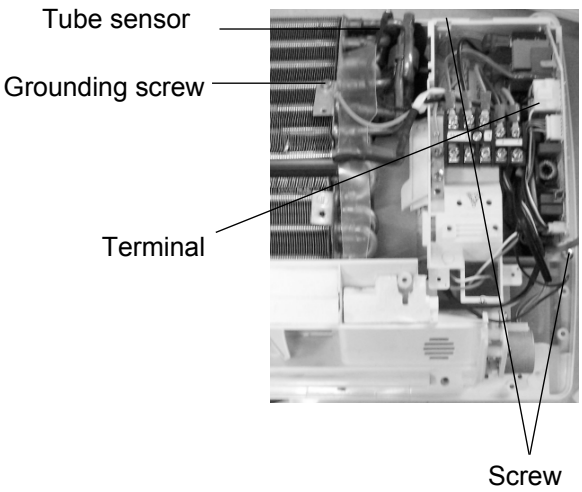
6.Disassembling the water-tray assy

Unloose the clasp on the left side and unplug the connecting terminal of the stepping motor. Be careful because the drainage pipe is placed here.



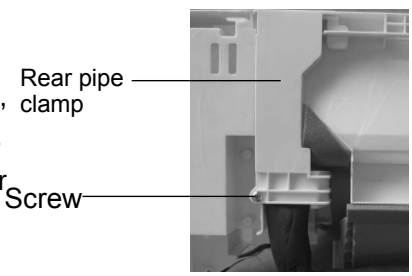
7. **Disassemble Electric Box**

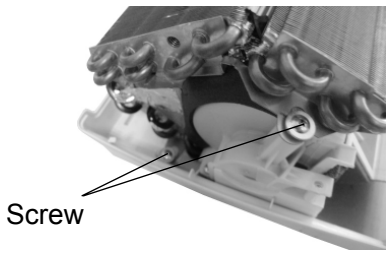
Remove the screw fixing the electric box, disconnect the terminal of connecting line, loosen the clasps and grounding screws, remove the tube sensor,then take out the electric box.

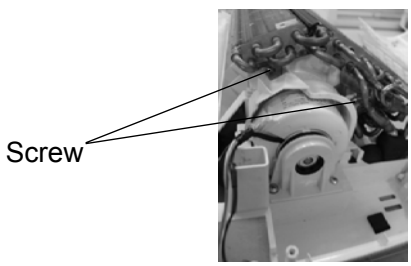


8. **Disassemble Evaporator**

Unscrew the screw to remove the rear pipe clamp. Remove the left and right screws at the evaporator, manually move the evaporator to loosen the clasp of its side plate from the groove. Carefully take out the evaporator and pay attention to protect the connecting pipe.



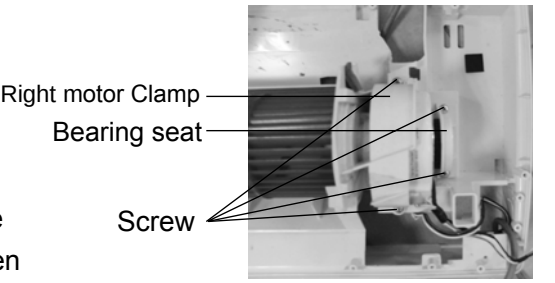




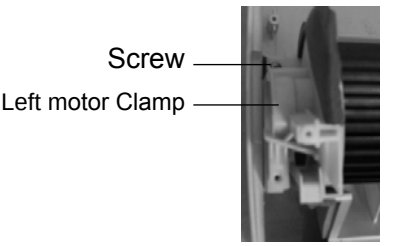
Operating Procedures / Photos

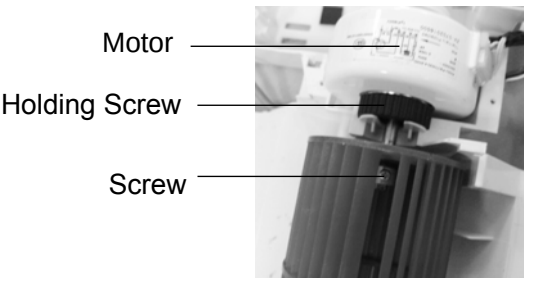
9. **Disassemble Motor**

Unscrew the 4 screws fixing the motor clamp, and remove the motor clamp.



Loosen the holding nut at the shaft sleeve on the right side of the cross flow fan. Slightly lift and then pull out the motor.





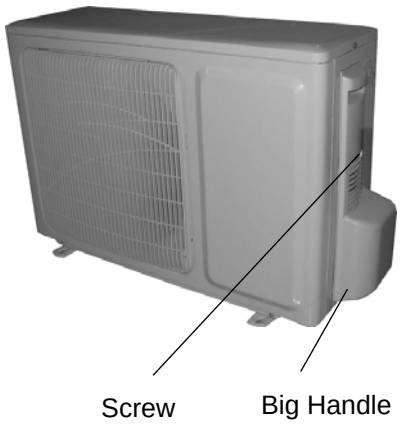
10. Disassembling the cross flow fan

Refer to the above steps to take out the cross flow fan from the base plate after taking out the motor.

7. Disassembly Procedure of Outdoor Unit

1.Disassemble Big Handle

Unscrew the screw fixing the big handle,and then remove it downwards to take it out.

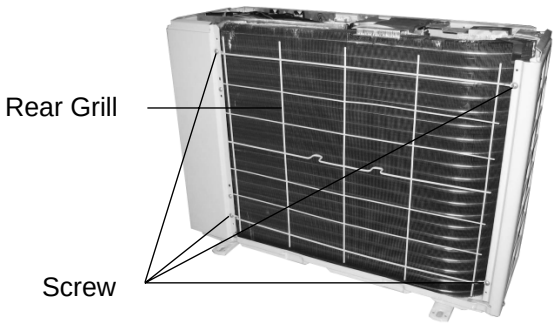


2.Disassemble Top Cover

Unscrew the 2 screws fixing left side of top cover and the 1 screw fixing the right side to remove the top cover.

3.Disassemble Rear Grill

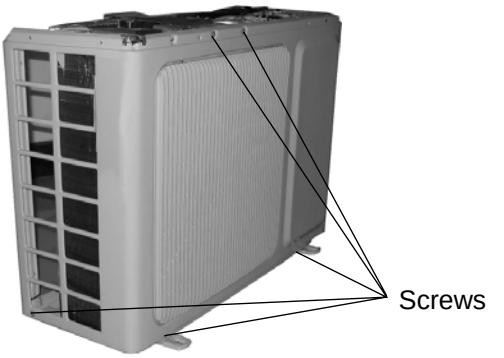
Unscrew the 4 screws fixing the rear grill to remove it.



Operating Procedures / Photos

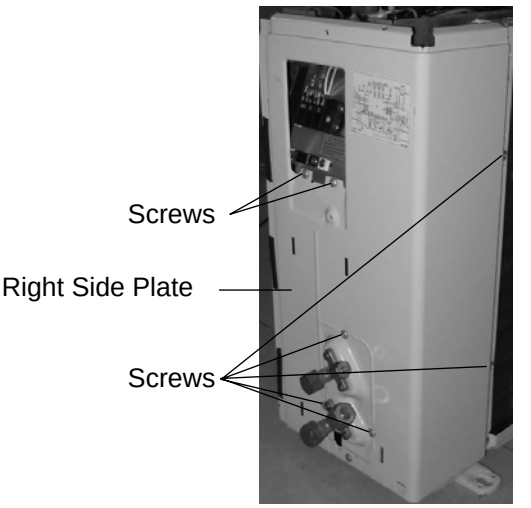
4.Disassemble Front Panel

Unscrew the 5 screws fixing the panel and dextro-rotate the front panel to pull it out from groove.



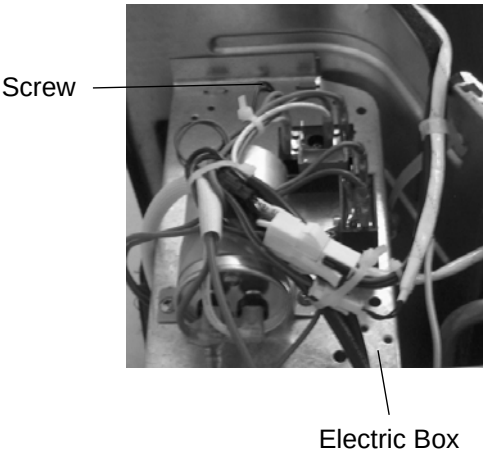
5.Disassemble Right Side Plate

Unscrew the 2 screws fixing electric box ,and then unscrew the 5 screws fixing the right side plate to remove it.



6.Disassemble Electric Box

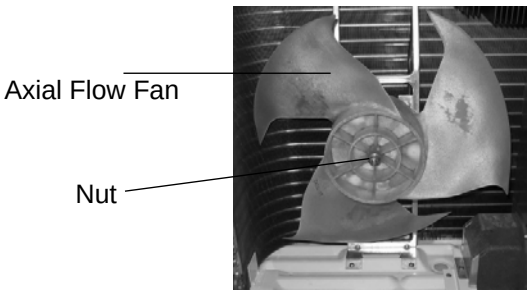
Unscrew the screws fixing the electric box, and then pull out the inset block of lead-out wire of compressor and fan motor to take out the electric box.



Operating Procedures / Photos

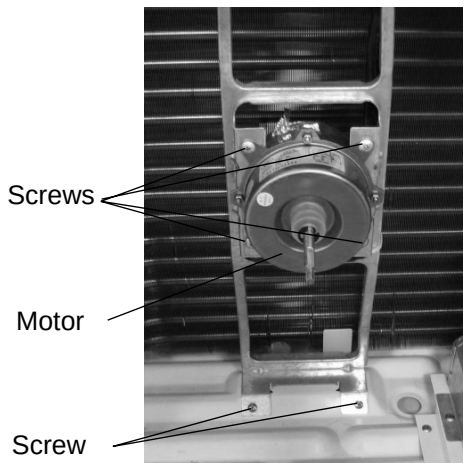
7.Disassemble Axial Flow Fan

Loosen the fastening nut fixing the axial flow fan with a spanner ,and then take out the nut,spring gasket and flap gasket in turn.



8.Disassemble Motor and Motor Support

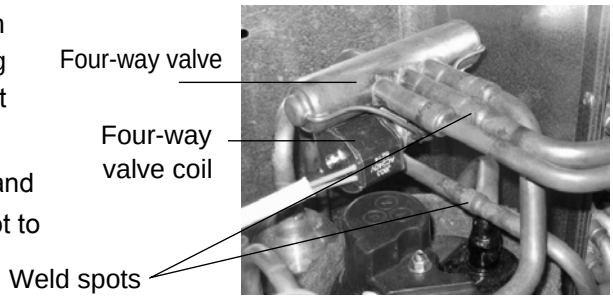
Unscrew the 4 screws fixing the motor to take out the motor,and then unscrew the 2 screws fixing the motor support to take it out.



9.Disassemble Four-way Valve

Unscrew the fastening nut of the four-way valve coil and remove the coil. Wrap the four-way valve with wet cotton and unsolder the 4 weld spots connecting the four-way valve to take it out. (Note:Refrigerant should be discharged firstly.)

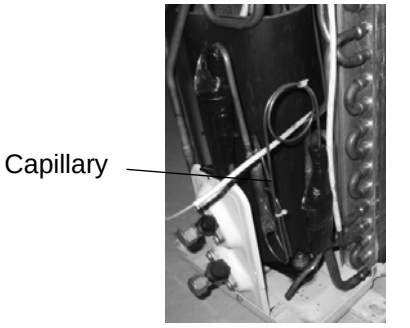
Welding process should be as quick as possible and keep wrapping cotton wet all the time. Be sure not to burn out the lead-out wire of compressor.



Operating Procedures / Photos

10. Disassemble Capillary

Respectively unsolder the weld spots of main capillary and auxiliary capillary to take off the capillary.

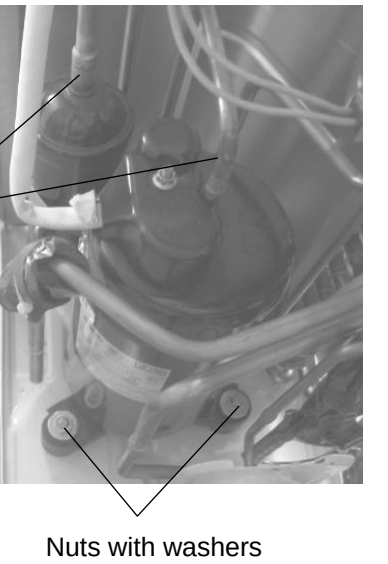


11.Disassemble Gas and Liquid Valves

Unscrew the two bolts fixing gas valve and liquid valve.Unsolder weld spots between gas valve and and air-return pipe to remove the gas valve.
Unscrew the two bolts fixing liquid valve. Unsolder weld spots between liquid valve and capillary to remove the liquid valve.
(Note:During unsoldering ,wrap the valves with wet cloth to avoid damage for high temperature.)

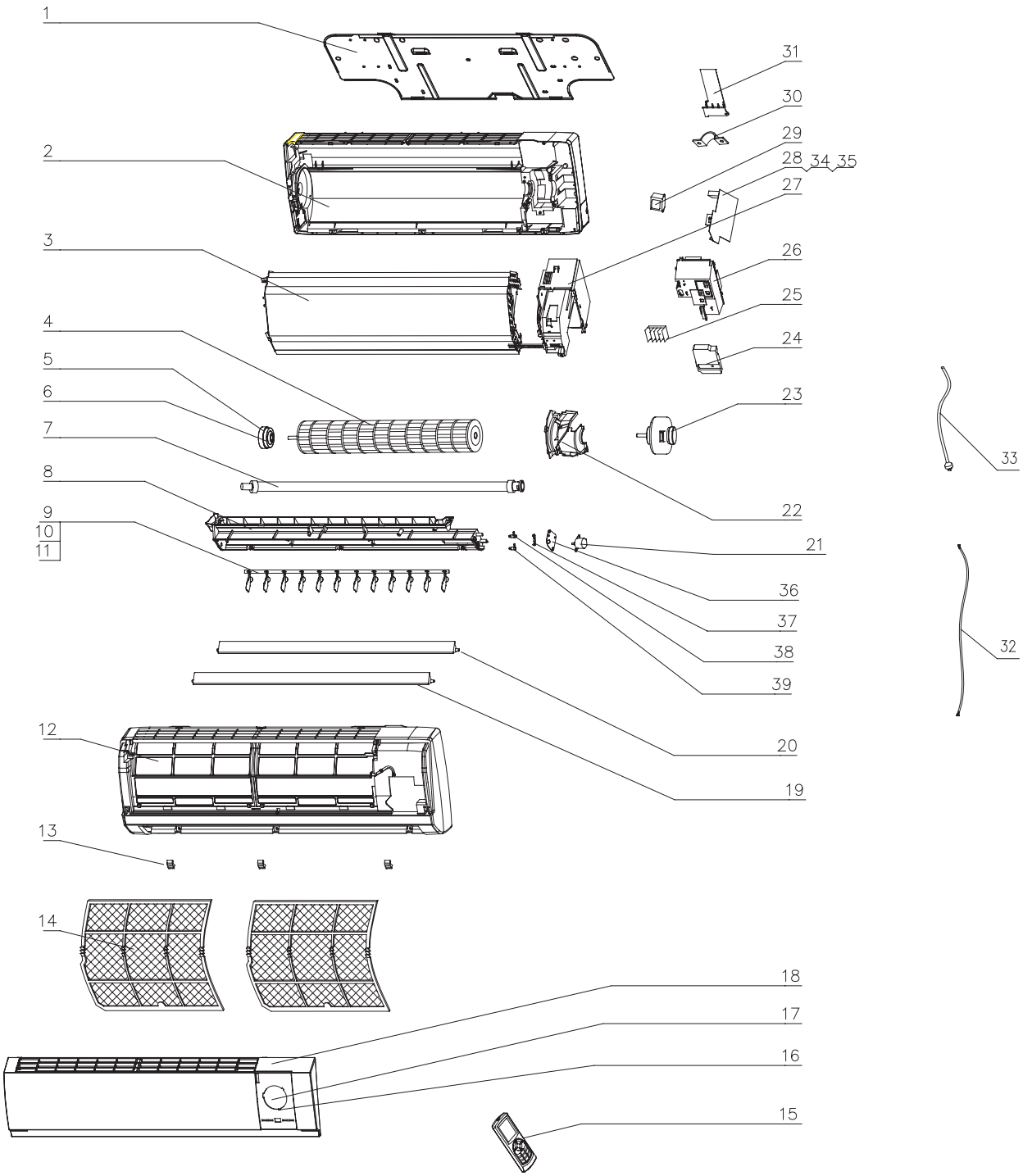
12.Disassemble Compressor

Unscrew the three foot-nuts at the foot of the compressor.
Unsolder the suction and the discharge pipes of the compressor,and then carefully remove the pipes to take out the compressor.



8 Explosive view and spare parts list

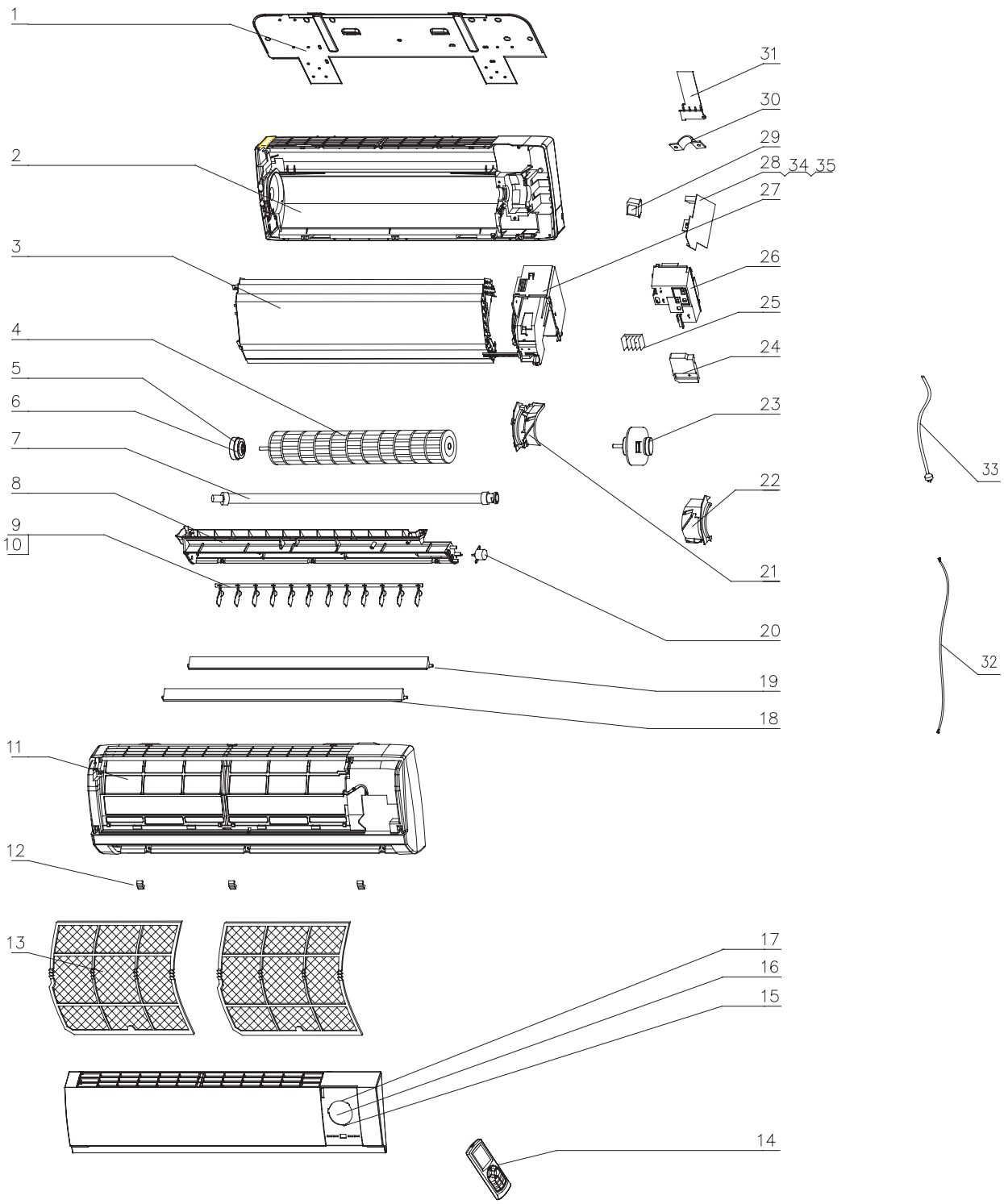
8. 1 Exploded View of Components and Parts of Indoor Unit ASH-09AIN PT



No	Description	Part Code	Qty
		ASH-09AIN	
1	Wall-Mounting Frame	01252220	1
2	Rear Case	222020016	1
3	Evaporator Assy	0100209319	1
4	Cross Flow Fan	10352001	1
5	Ring of Bearing	76512203	1
6	Fan Bearing	/	1
7	Drainage Pipe	0523001401	1
8	Water Tray	201820272	1
9	Swing Louver	10512080	1
10	Swing Linkage 1	10582002	1
11	Swing Linkage 2	10582003	1
12	Front Case	200022105	1
13	Screw Cover	242520062	3
14	Filter	11122002	2
15	Remote Control Y612C-B	30511005	1
16	Decorate Piece	68012019	1
17	Receiver Board	30545702	1
18	Front Panel	200022092	1
19	Guide Louver 2	105120342	1
20	Guide Louver 1	105120332	1
21	Motor MP28VA	15212110	1
22	Motor Clamp A	26112014	1
23	Motor FN14A	150121081	1
24	Electric Box Cover	22242030	1
25	Terminal Board T4B3A	42011233	1
26	Covering Plate	201220061	1
27	Electric Box	20102178	1
28	Main PCB 9M82	30039046	1
29	Transformer 48X26G	43110233	1
30	Wire Clamp	71010103	1
31	Rear Clamp	24242001	1
32	Connecting Cable	400205235	1
33	Power Cord	400204643	1
34	Room Sensor 15K	390000451	1
35	Tube Sensor 20K	390000591	1
36	swing louver clamp	10582409	1
37	swing louver	10582408	1
38	swing louver(up)	10542004	1
39	swing louver(down)	10542005	1

The above data is subject to change without prior notice.

8. 3 Exploded View of Components and Parts of Indoor Unit ASH-12AIN PT

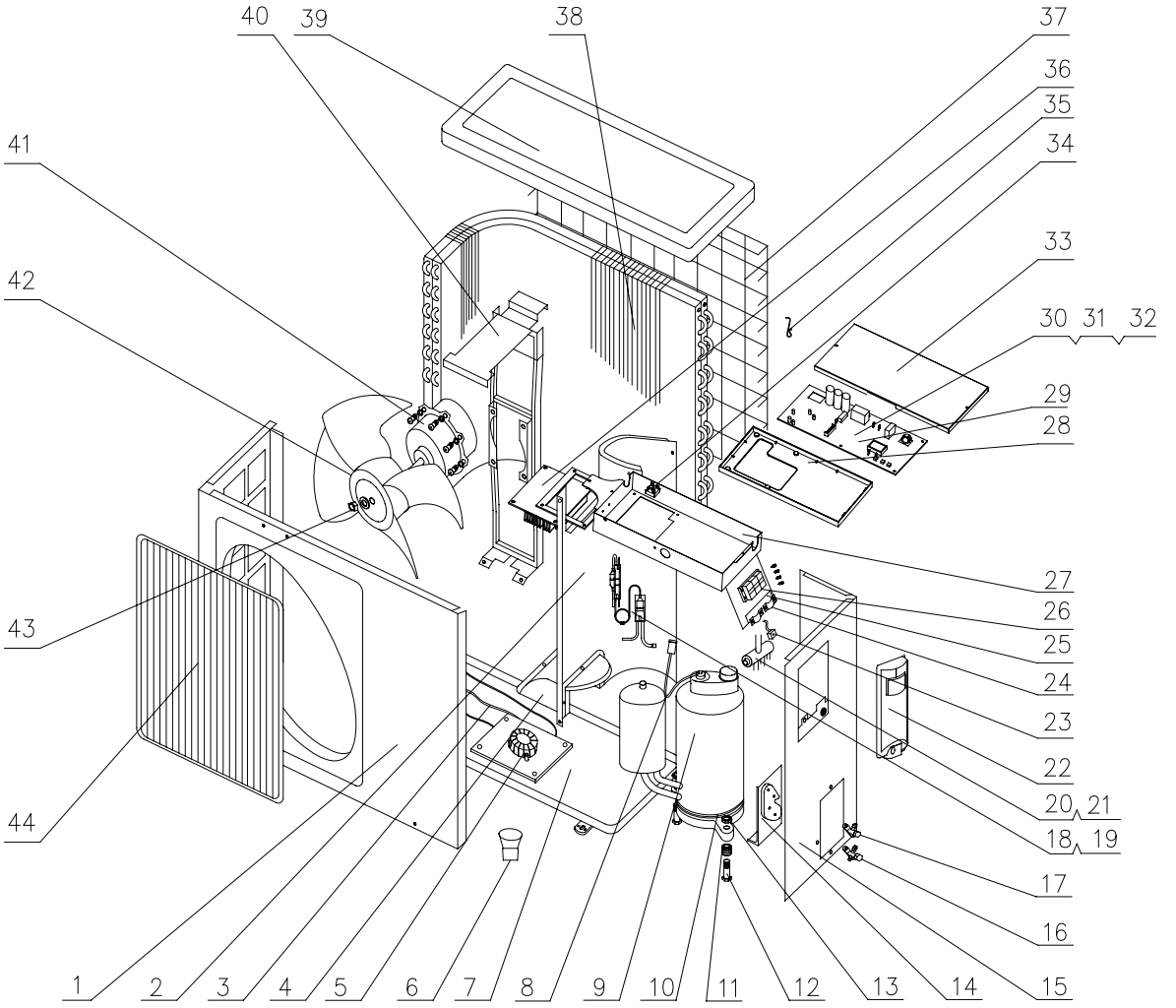


No	Description	Part Code	Qty
		ASH-12AIN PT	
1	Wall-Mounting Frame	01252384	1
2	Rear Case	22202050	1
3	Evaporator Assy	010020212	1
4	Cross Flow Fan	10352005	1
5	Ring of Bearing	76712015	1
6	Fan Bearing	76512210	1
7	Drainage Pipe	0523001401	1
8	Water Tray	201820394	1
9	Swing Louver	105120413	1
10	Swing Linkage	10582439	1
11	Front Case	200022956	1
12	Screw Cover	24252007	3
13	Filter	11122440	2
14	Remote Control YB1B4	30511005	1
15	Front Panel	200022921	1
16	Decorate Piece	68012019	1
17	Receiver Board	30545558	1
18	Guide Louver	261120432	1
19	Guide Louver	261120422	1
20	Motor MP28VA	15212105	1
21	Motor Left Clamp	261124281	1
22	Motor Right Clamp	26112429	1
23	Motor FN20G	15012058	1
24	Electric Box Cover	22242017	1
25	Terminal Board T4B3A	42011233	1
26	Covering Plate	20102123	1
27	Electric Box	20102108	1
28	Main PCB 9H82	30039085	1
29	Transformer 57X25C	43110237	1
30	Wire Clamp	71010003	1
31	Rear Clamp	26112425	1
32	Connecting Cable	40020538	1
33	Power Cord	400204643	1
34	Room Sensor 15K	390000451	1
35	Tube Sensor 20K	390000591	1

The above data is subject to change without prior notice.

8. 7 Components and Parts List of Outdoor Unit(2)

ASH-09AIN PT and ASH-12AIN PT

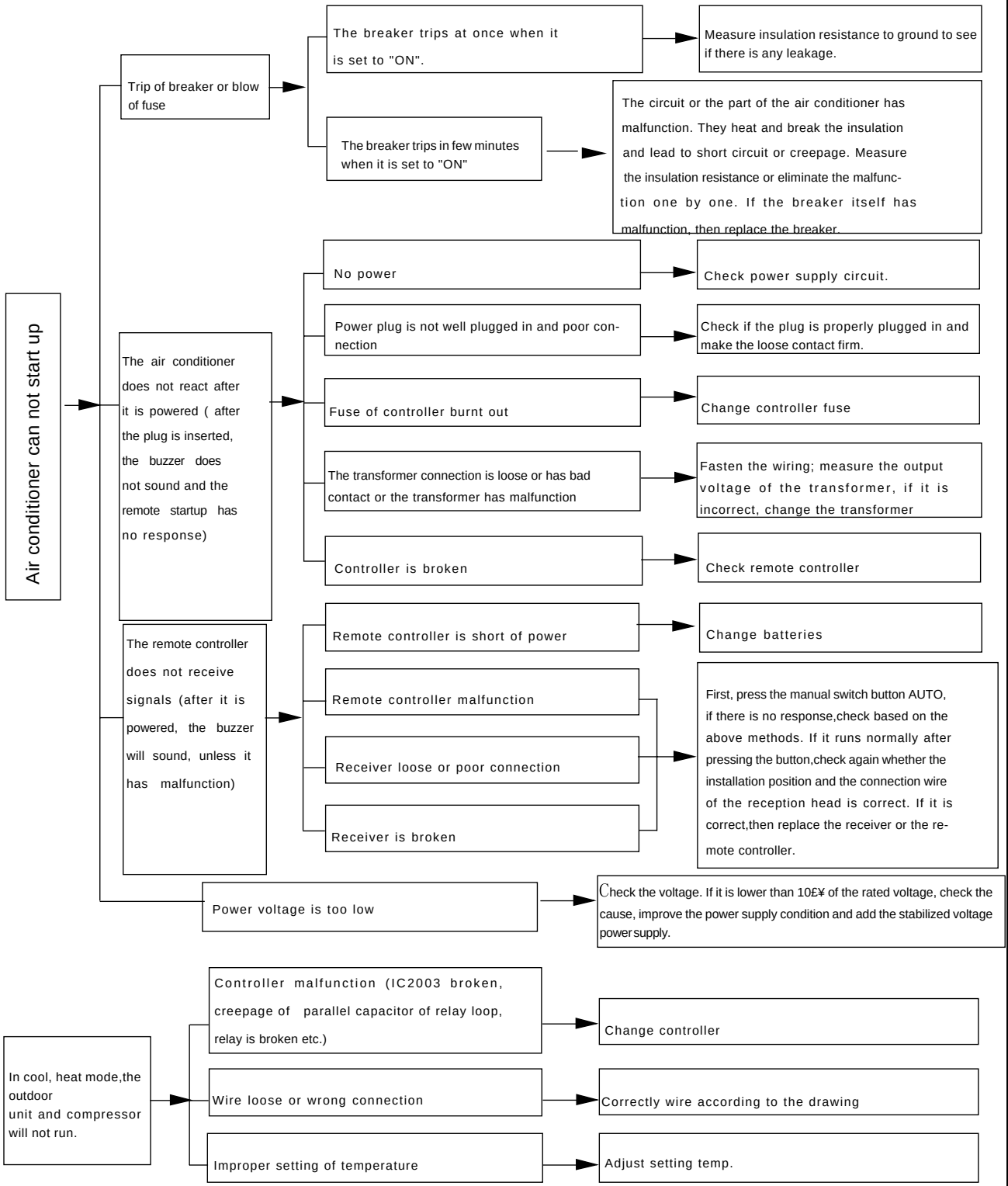


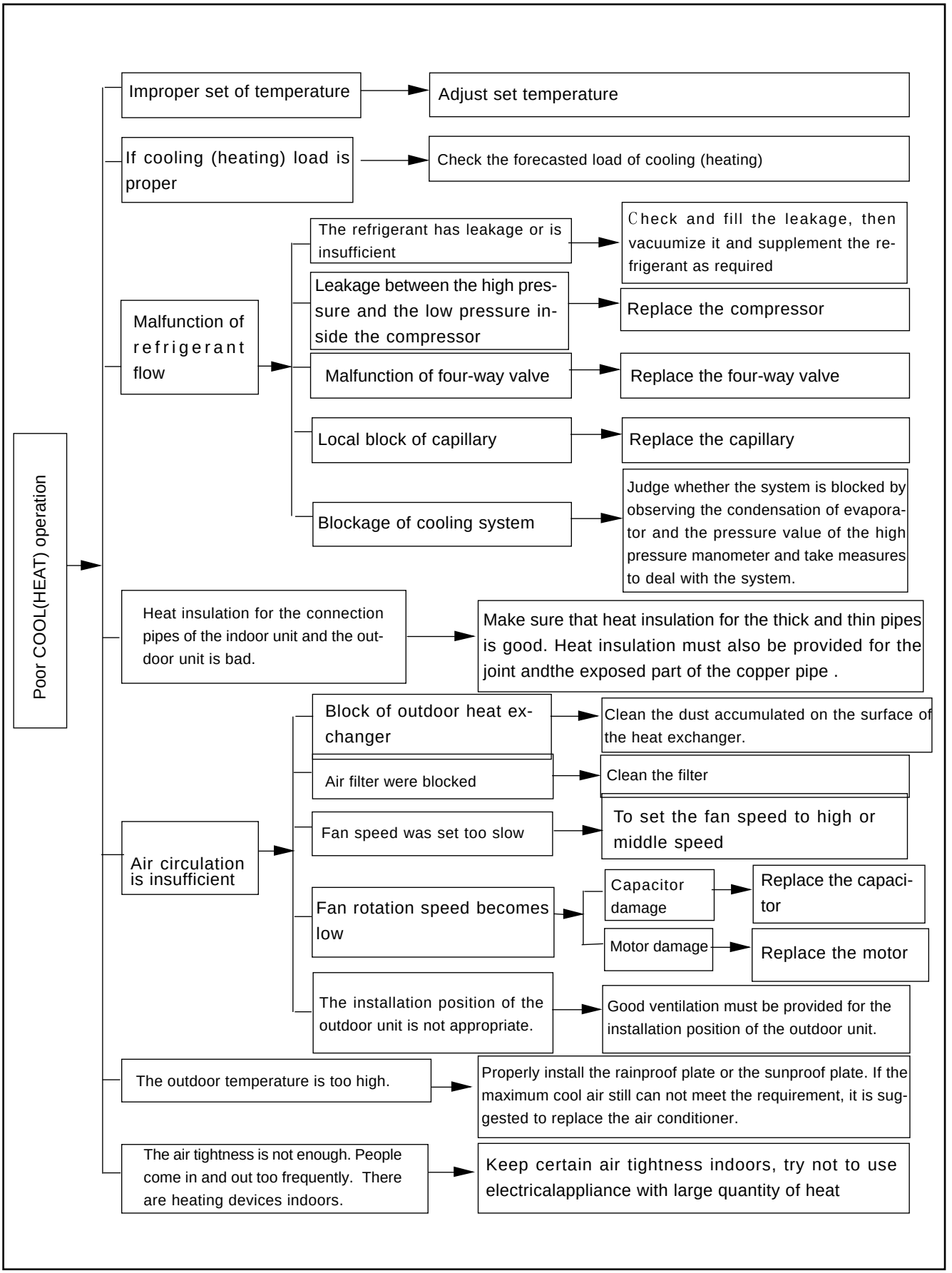
8.8

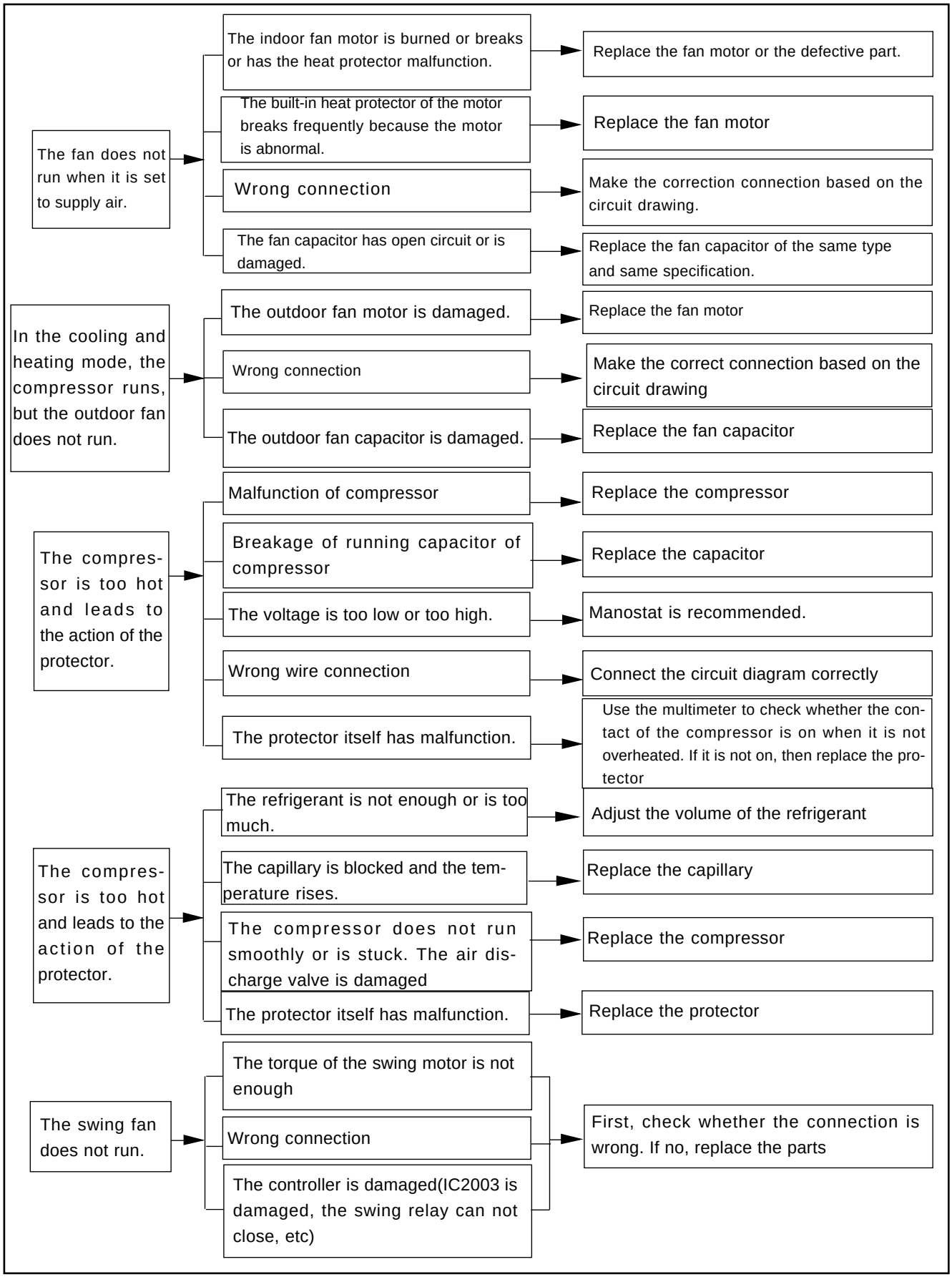
No	Description	Part Code		Qty
		ASH-09AION PT	ASH-12AIN PT	
1	Front Panel	01533005	01533005	1
2	Clap Board	01233012	01233012	1
3	Heating cable (chassis)	/	76510004	1
4	Reactor Box	01403617	01413504	1
5	PFC Inductance 0.8mH/20A	/	99070120	1
6	Drainage Connecter	06123401	06123401	1
7	Reactor Support	01203682P	0120352402	1
8	Overload Protector	/	00183003	1
9	Compressor	00120228	00120228	1
10	Heating cable	76513004	76513004	1
11	Compressor Gasket	/	76710236	3
12	Bolt	70210108	70210108	3
13	Nut	70310011	70310013	3
14	Valve Support	01713041	01713041	1
15	Right Side Plate	0130200401	01303048	1
16	Valve	07100003	07100006	1
17	Valve	07100005	07100003	1
18	Capillary Assy	0310333305	031030716	1
19	One Way Valve	/	071301025	1
20	4-Way Valve	430004022	430004032	1
21	4-way Rever-sing Valve Component	03123042	03123013	1
22	Big Handle	26233433	26233433	1
23	4-way Valve Coil	430004002	430004002	1
24	Wire Clap	71010003	71010003	1
25	Insulation Piece D	70410525	70410525	1
26	Terminal Board A	42011113	42011113	1
27	Electric Box 2	01403998	01413116	1
28	Electric Box	20113005	20113005	1
29	PCB	301380021	30039155	1
30	Temperature Sensor	39000208	39000208	1
31	Sensor 20K	390001921	39000071	1
32	Exhaust Gas Temperature Sensor 50K	39000016	39000016	1
33	Electric Box Cover	01413048	01413048	1
34	Rectifier S25VB60	/	46010602	1
35	Sensor Insert	42020063	42020063	1
36	Radiator	49010065	49010213	1
37	Rear Grill	01473023	01473030	1
38	Condenser Assy	0110359012	0111308202	1
39	Top Cover Assy	01253261	01253261	1
40	Motor Support	01705002	017030531	1
41	Motor	150130671	15013067	1
42	Axial Flow Fan	10333414	10333004	1
43	Nut	70310131	70310131	1
44	Front Grill	22413431	22413431	1

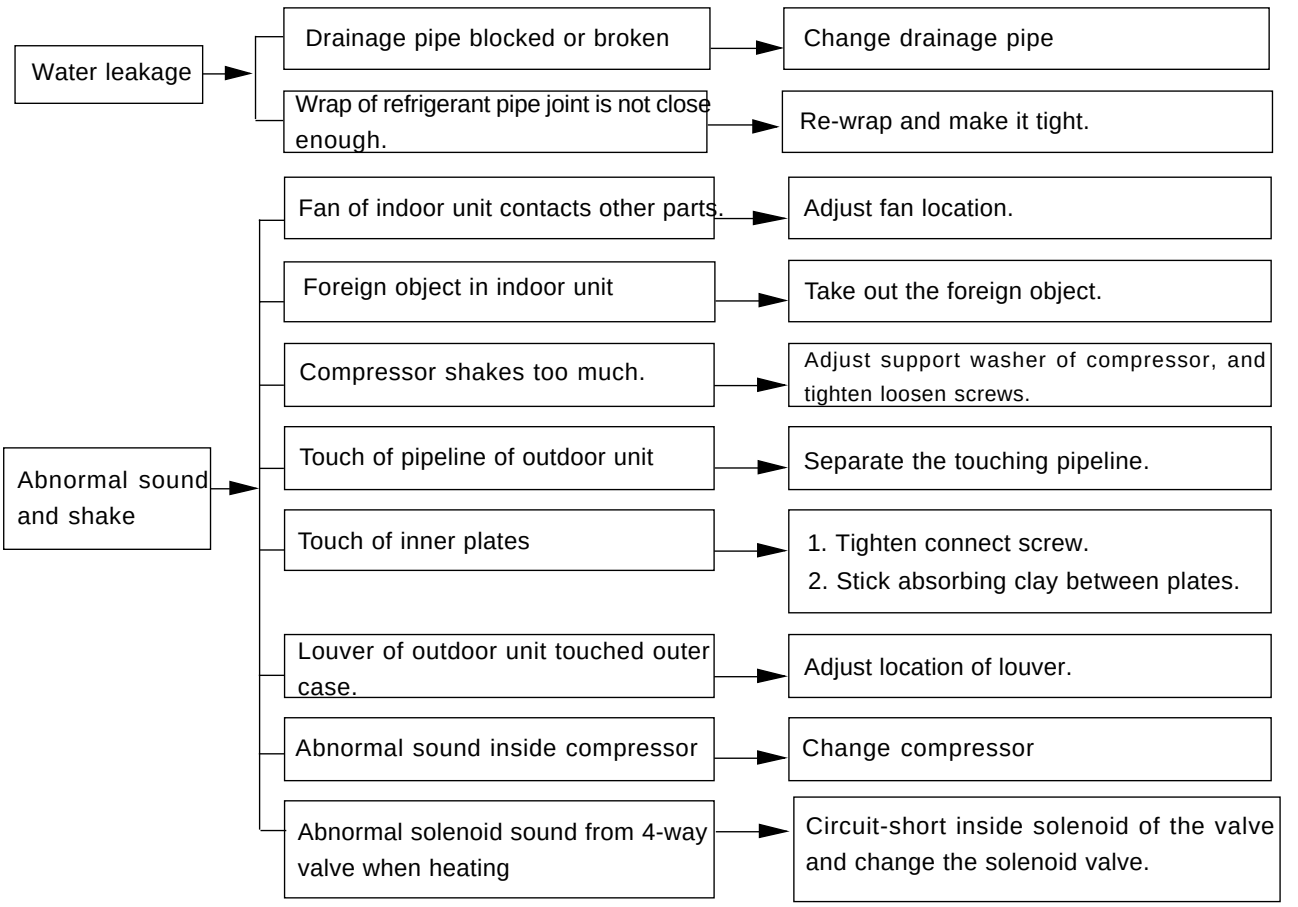
9 Failure and analysis

Analysis in this section is used for Linge Wind D.C. Inverter Series. Before analysis, you can diagnose according to the indicator display on outdoor unit.


Air conditioner can not start up
Trip of breaker or blow of fuse
The breaker trips at once when it is set to "ON".
Measure insulation resistance to ground to see if there is any leakage.
The breaker trips in few minutes when it is set to "ON"
The circuit or the part of the air conditioner has malfunction. They heat and break the insulation and lead to short circuit or creepage. Measure the insulation resistance or eliminate the malfunction one by one. If the breaker itself has malfunction, then replace the breaker.
The air conditioner does not react after it is powered (after the plug is inserted, the buzzer does not sound and the remote startup has no response)
No power
Check power supply circuit.
Power plug is not well plugged in and poor connection
Check if the plug is properly plugged in and make the loose contact firm.
Fuse of controller burnt out
Change controller fuse
The transformer connection is loose or has bad contact or the transformer has malfunction
Fasten the wiring; measure the output voltage of the transformer, if it is incorrect, change the transformer
Controller is broken
Check remote controller
The remote controller does not receive signals (after it is powered, the buzzer will sound, unless it has malfunction)
Remote controller is short of power
Change batteries
Remote controller malfunction
Receiver loose or poor connection
Receiver is broken
First, press the manual switch button AUTO, if there is no response,check based on the above methods. If it runs normally after pressing the button,check again whether the installation position and the connection wire of the reception head is correct. If it is correct,then replace the receiver or the remote controller.
Power voltage is too low
Check the voltage. If it is lower than 10£¥ of the rated voltage, check the cause, improve the power supply condition and add the stabilized voltage power supply.
In cool, heat mode,the outdoor unit and compressor will not run.
Controller malfunction (IC2003 broken, creepage of parallel capacitor of relay loop, relay is broken etc.)
Change controller
Wire loose or wrong connection
Correctly wire according to the drawing
Improper setting of temperature
Adjust setting temp.


Poor COOL(HEAT) operation
Improper set of temperature
Adjust set temperature
If cooling (heating) load is proper
Check the forecasted load of cooling (heating)
Malfunction of refrigerant flow
The refrigerant has leakage or is insufficient
Check and fill the leakage, then vacuumize it and supplement the refrigerant as required
Leakage between the high pressure and the low pressure inside the compressor
Replace the compressor
Malfunction of four-way valve
Replace the four-way valve
Local block of capillary
Replace the capillary
Blockage of cooling system
Judge whether the system is blocked by observing the condensation of evaporator and the pressure value of the high pressure manometer and take measures to deal with the system.
Heat insulation for the connection pipes of the indoor unit and the outdoor unit is bad.
Make sure that heat insulation for the thick and thin pipes is good. Heat insulation must also be provided for the joint andthe exposed part of the copper pipe .
Air circulation is insufficient
Block of outdoor heat exchanger
Clean the dust accumulated on the surface of the heat exchanger.
Air filter were blocked
Clean the filter
Fan speed was set too slow
To set the fan speed to high or middle speed
Fan rotation speed becomes low
Capacitor damage
Replace the capacitor
Motor damage
Replace the motor
The installation position of the outdoor unit is not appropriate.
Good ventilation must be provided for the installation position of the outdoor unit.
The outdoor temperature is too high.
Properly install the rainproof plate or the sunproof plate. If the maximum cool air still can not meet the requirement, it is suggested to replace the air conditioner.
The air tightness is not enough. People come in and out too frequently. There are heating devices indoors.
Keep certain air tightness indoors, try not to use electricalappliance with large quantity of heat


The fan does not run when it is set to supply air.
The indoor fan motor is burned or breaks or has the heat protector malfunction.
Replace the fan motor or the defective part.
The built-in heat protector of the motor breaks frequently because the motor is abnormal.
Replace the fan motor
Wrong connection
Make the correction connection based on the circuit drawing.
The fan capacitor has open circuit or is damaged.
Replace the fan capacitor of the same type and same specification.
In the cooling and heating mode, the compressor runs, but the outdoor fan does not run.
The outdoor fan motor is damaged.
Replace the fan motor
Wrong connection
Make the correct connection based on the circuit drawing
The outdoor fan capacitor is damaged.
Replace the fan capacitor
The compressor is too hot and leads to the action of the protector.
Malfunction of compressor
Replace the compressor
Breakage of running capacitor of compressor
Replace the capacitor
The voltage is too low or too high.
Manostat is recommended.
Wrong wire connection
Connect the circuit diagram correctly
The protector itself has malfunction.
Use the multimeter to check whether the contact of the compressor is on when it is not overheated. If it is not on, then replace the protector
The compressor is too hot and leads to the action of the protector.
The refrigerant is not enough or is too much.
Adjust the volume of the refrigerant
The capillary is blocked and the temperature rises.
Replace the capillary
The compressor does not run smoothly or is stuck. The air discharge valve is damaged
Replace the compressor
The protector itself has malfunction.
Replace the protector
The swing fan does not run.
The torque of the swing motor is not enough
Wrong connection
The controller is damaged(IC2003 is damaged, the swing relay can not close, etc)
First, check whether the connection is wrong. If no, replace the parts


Water leakage
Drainage pipe blocked or broken
Change drainage pipe
Wrap of refrigerant pipe joint is not close enough.
Re-wrap and make it tight.
Abnormal sound and shake
Fan of indoor unit contacts other parts.
Adjust fan location.
Foreign object in indoor unit
Take out the foreign object.
Compressor shakes too much.
Adjust support washer of compressor, and tighten loosen screws.
Touch of pipeline of outdoor unit
Separate the touching pipeline.
Touch of inner plates
1. Tighten connect screw.
2. Stick absorbing clay between plates.
Louver of outdoor unit touched outer case.
Adjust location of louver.
Abnormal sound inside compressor
Change compressor
Abnormal solenoid sound from 4-way valve when heating
Circuit-short inside solenoid of the valve and change the solenoid valve.

There are no heating malfunctions in the above for the cooling only unit.

Note:

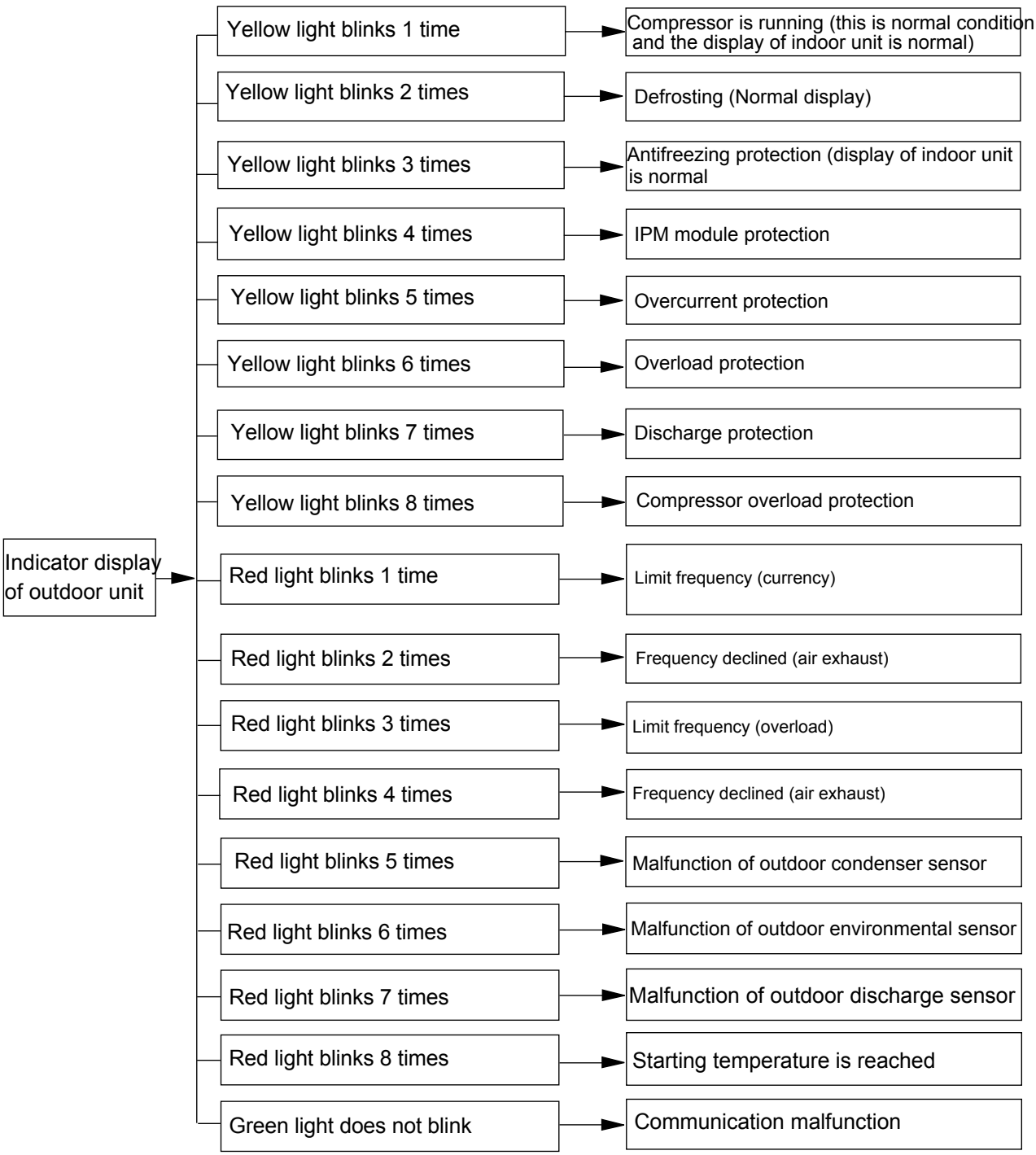
1. When maintaining, before detecting the voltage between the modular PN is less than 50V, please never touch any of the terminals, in order to avoid electric shock.
2. When replacing the batteries, commutating bridge, both of them should be coated with the coolant.

Malfunction display section

Trendy D.C. Inverter Series

When malfunction or protection occurs in the air conditioner,the indicator of outdoor unit will blink accordingly as well. When protection or malfunction is eliminated, display will be back to normal

1. Indicator display of outdoor unit


Indicator display of outdoor unit
Yellow light blinks 1 time
Compressor is running (this is normal condition and the display of indoor unit is normal)
Yellow light blinks 2 times
Defrosting (Normal display)
Yellow light blinks 3 times
Antifreezing protection (display of indoor unit is normal
Yellow light blinks 4 times
IPM module protection
Yellow light blinks 5 times
Overcurrent protection
Yellow light blinks 6 times
Overload protection
Yellow light blinks 7 times
Discharge protection
Yellow light blinks 8 times
Compressor overload protection
Red light blinks 1 time
Limit frequency (currency)
Red light blinks 2 times
Frequency declined (air exhaust)
Red light blinks 3 times
Limit frequency (overload)
Red light blinks 4 times
Frequency declined (air exhaust)
Red light blinks 5 times
Malfunction of outdoor condenser sensor
Red light blinks 6 times
Malfunction of outdoor environmental sensor
Red light blinks 7 times
Malfunction of outdoor discharge sensor
Red light blinks 8 times
Starting temperature is reached
Green light does not blink
Communication malfunction

2. Analysis or handling of some of the malfunction display:

1. Compressor discharge protection

Possible reasons: shortage of refrigerant; blockage of air filter; poor ventilation or air flow short pass for condenser; the system has noncondensing gas (such as air, water etc.); blockage of capillary assy (including filter); leakage inside four-way valve causes incorrect operation; malfunction of compressor; malfunction of protection relay; malfunction of discharge sensor; outdoor temperature too high.

Handling method: refer to the malfunction analysis in the above section.

2. Low voltage overcurrent protection

Possible reason: Sudden drop of supply voltage.

3. Communication malfunction

Handling method: Check if communication signal cable is connected reliably

4. Sensor open or short circuit

Handling method: Check whether sensor is normal, connected with the corresponding position on the controller and if damage of lead wire is found

5. Compressor overload protectio

Possible reasons: shortage of refrigerant; blockage of capillary and increase of suction temperature; improper running of compressor, burning in or stuck of bearing, damage of discharge valve; malfunction of protector.

Handling method: adjust refrigerant amount; replace the capillary; replace the compressor; use universal meter to check if the contactor of compressor is fine when it is not overheated, if not replace the protector.

6. System malfunction

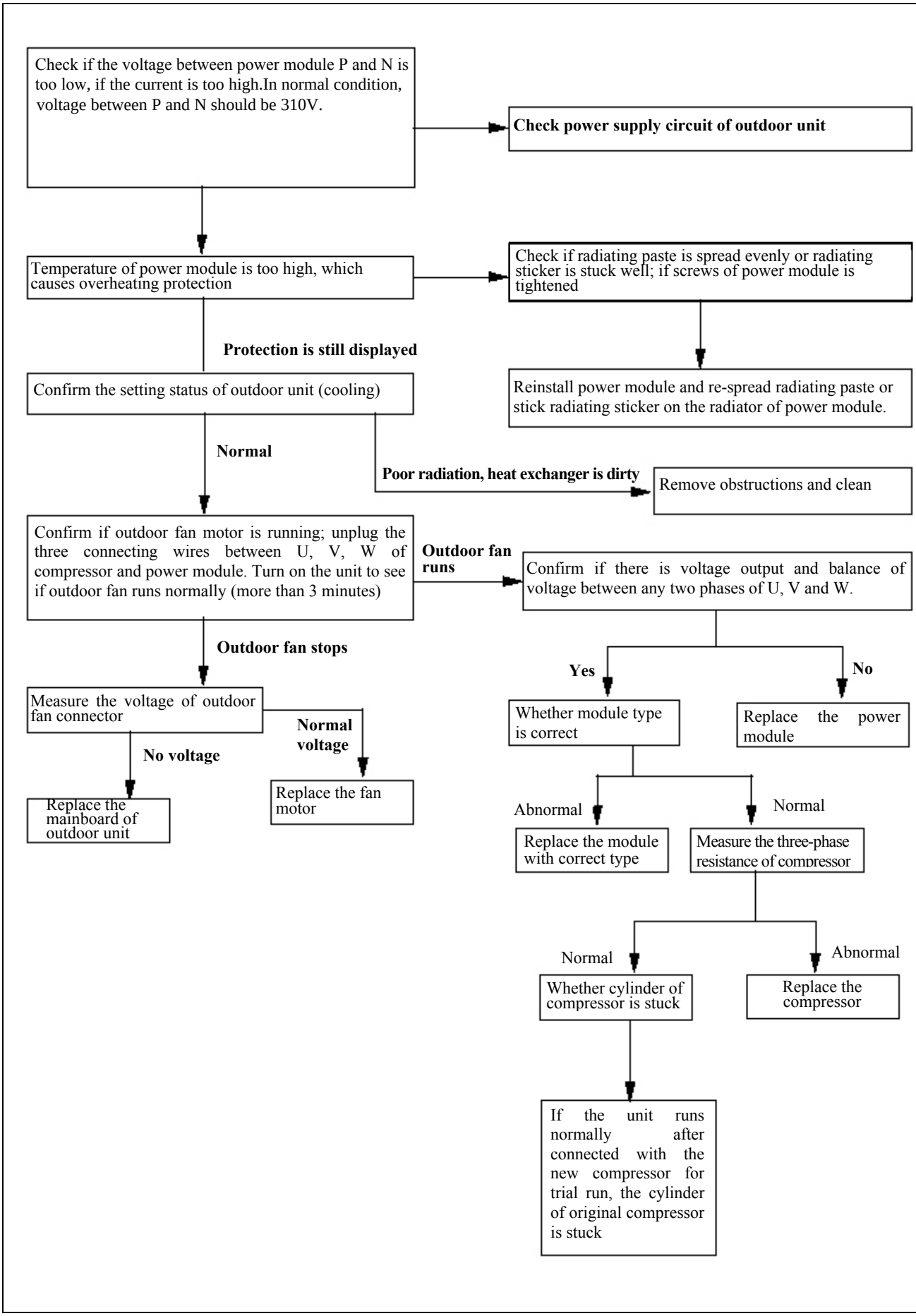
i.e. overload protection. When tube temperature (Check the temperature of outdoor heat exchanger when cooling and check the temperature of indoor heat exchanger when heating) is too high,protection will be activated.

Possible reasons: Outdoor temperature is too high when cooling; insufficient outdoor air circulation;

please refer to the malfunction analysis in the previous section for handling method for refrigerant flow.

7. IPM module protection

Processing method:Once the module malfunction happens,if it persists for a long time and can not be self- canceled, cut off the power and turn off the unit,and then re-energize the unit again after about 10 min.After repeating the procedure for sever times, if the malfunction still exists,replace the module.(refer to the next page)


Check if the voltage between power module P and N is too low, if the current is too high.In normal condition, voltage between P and N should be 310V.
Check power supply circuit of outdoor unit
Temperature of power module is too high, which causes overheating protection
Check if radiating paste is spread evenly or radiating sticker is stuck well; if screws of power module is tightened
Protection is still displayed
Reinstall power module and re-spread radiating paste or stick radiating sticker on the radiator of power module.
Confirm the setting status of outdoor unit (cooling)
Normal
Poor radiation, heat exchanger is dirty
Remove obstructions and clean
Confirm if outdoor fan motor is running; unplug the three connecting wires between U, V, W of compressor and power module. Turn on the unit to see if outdoor fan runs normally (more than 3 minutes)
Outdoor fan runs
Confirm if there is voltage output and balance of voltage between any two phases of U, V and W.
Outdoor fan stops
Yes
No
Measure the voltage of outdoor fan connector
Normal voltage
No voltage
Whether module type is correct
Replace the power module
Replace the mainboard of outdoor unit
Replace the fan motor
Abnormal
Normal
Replace the module with correct type
Measure the three-phase resistance of compressor
Normal
Abnormal
Whether cylinder of compressor is stuck
Replace the compressor
If the unit runs normally after connected with the new compressor for trial run, the cylinder of original compressor is stuck

Name of malfunction	Display of indoor unit	State of the lamps on the outdoor unit PCB			Reasons
	ERROR CODE	GREEN-LED2	RED-LED3	YELLOW-LED4	
Stop for anti-freezing protection of indoor unit	E2		blink 4 times	blink 3 times	refrigerant leakage, indoor unit airflow blocked up, filter duty
Stop for exhaust protection	E4			blink 7 times	less refrigerant, capillary blocked up, ambient temperature is unsuitable
Stop for low voltage protection	E5			blink 5 times	low voltage, ambient temperature is unsuitable
Stop for communication malfunction	E6	don´t blink			communication line failure, main PCB failure, interfere source, connect line wrong
Stop for compressor overload protection	H3			blink 8 times	compressor shell oer heat, less refrigerant, capillary blocked up
Overload protection	H4			blink 6 times	ambient temperature is unsuitable, heat exhanger blocked up
Stop for IPM module protection	H5			blink 4 times	IPM modul over heat, low voltage, silica gel
Indoor ambient temperature sensor malfunction	F1				terminal connect not reliable, temperature sensor malfunction
Indoor tube temperature sensor malfunction	F2				terminal connect not reliable, temperature sensor malfunction
Outdoor ambient temperature sensor malfunction	F3		blink 6 times		terminal connect not reliable, temperature sensor malfunction
Outdoor tube temperature sensor malfunction	F4		blink 5 times		terminal connect not reliable, temperature sensor malfunction
Outdoor exhaust temperature sensor malfunction	F5		blink 7 times		terminal connect not reliable, temperature sensor malfunction
Automatic defrosting	H1			blink 2 times	H1 isn´t an error code, it´s a normal operation. Just heat pump has this function.
REMARK:	1. Error codes can only be seen in the type which has the temperature display PCB. If some type hasn´t this function, the lamps on the outdoor PCB are available then.				
	2. Normally, the communication between indoor unit and outdoor unit is successful, the green lamp (Led2) of outdoor PCB blinks 1sec. on, 1sec. off.				
	3. The red and yellow lamp blinks 0.5 sec. on, 0.5 sec. off, between two error display cycle, it will be 2 sec. off.				
	4. Led1 (red) is power lamp. Led3 (red) blinks 8 times which means temperature be up to machine run. When compressor starts, Led4 (yellow) blinks 1 times.				